



# CORPORATION OF MADRAS



## HEALTH DEPARTMENT

### ANNUAL REPORT

1954

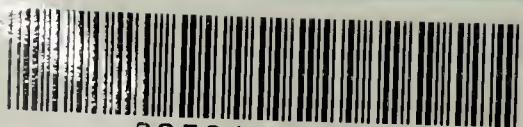


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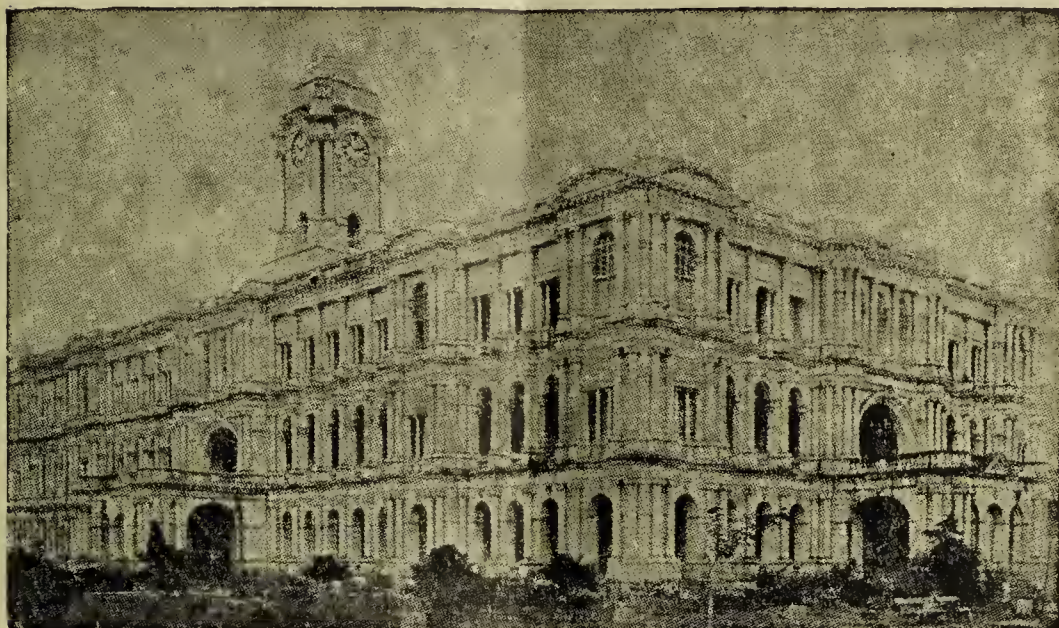
HEALTH OFFICER

CORPORATION OF MADRAS



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# CORPORATION OF MADRAS

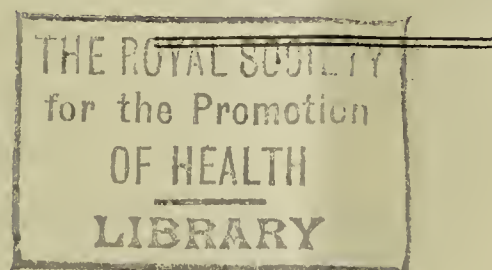


RIPON BUILDINGS

## HEALTH DEPARTMENT

### ANNUAL REPORT

1954



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1955



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# CORPORATION OF MADRAS

## HEALTH DEPARTMENT

### ANNUAL REPORT FOR 1954

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# CONSTITUTIONAL HISTORY

OF THE UNITED STATES

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## INTRODUCTION

In presenting the report on the health of the city of Madras during the year 1954, I propose to follow the procedure adopted by my predecessors and preface the report with the following observations.

Dr. S. E. D. Masilamani was the City Health Officer during the year. Consequent on his appointment as Deputy Director, the All India Institute of Hygiene, he has proceeded on leave from 15-2-55 preparatory to retirement from Corporation service and, as his successor in office, the presentation of this report has devolved on me. I have, therefore, to remark at the outset that noteworthy features pertaining to the health of the city in 1954 are due to his able health administration of the city and his initiative in matters of public health.

The health of the city as revealed by the report on the Vital Statistics for 1954 may be said to be a satisfactory one. There were 59,256 births and 33,181 deaths. The natural increase in the population of the city, as evidenced by the excess of births over deaths, has been a successive feature in the annals of the health of the city for more than a decade. 15,96,346 is the mid-year population as estimated by the Director-General of Health Services, New Delhi. The birth-rate of 37.12 per mille of the estimated population for the mid-year shows a slight increase over the figure for the previous year and the death-rate of 20.78 per mille of the estimated mid-year population is the lowest on record. Another noteworthy feature is that the infant mortality rate came down to 136.00 per 1000 live-births from 180.28 for the previous year.

The city was comparatively free from epidemics. There were 39 attacks and 4 deaths from cholera. There was a mild incidence of small-pox with 1,214 attacks and 277 deaths in the city. The maximum number of cases occurred in the first quarter, necessitating the prompt adoption of vigorous preventive measures to bring the disease under control and the spread of infection was held in check in the subsequent quarters. Enteric fever continued to prevail in a sporadic form and there were 1,140 cases. It is difficult to control this disease particularly when the occurrence of cases is sporadic and report from private practitioners is lacking.

A scheme was under consideration by the Government for the control of Kalazaar in the city. In view of the proposal to include this disease in the list of notified diseases under Section 62 of the Madras Public Health Act, the incidence of cases of Kalazaar is separately furnished in the report on Vital Statistics for the year.

There was no marked expansion in the Medical Services provided by the Corporation for the benefit of the ailing, particularly among the poorer sections of the city's population. The scheme of rendering medical aid in the extended areas by Mobile Medical Unit was strengthened by another unit as the nearest general dispensaries were not easily accessible to the residents of those areas. This was made possible by the gift of a van by the Andhra Chamber of Commerce for the purpose. By this act of munificence, the Andhra Chamber of Commerce has earned the gratitude of the Corporation and the public.



The number of Corporation elementary schools and the number of children studying in them have been steadily increasing year after year; but there has been no corresponding increase in the strength of the staff, conducting the medical inspection of school children. So the revised scheme of limiting the medical examination of the elementary school children at the time of their entrance, at the middle of their school career and at their school leaving age was continued. Medical attention for other children was bestowed whenever the need for such attention arose. On the initiative of the Commissioner a proposal was under consideration to appoint medical personnel on honorary basis for taking medical care of school children.

The Public Health Laboratory, the Public Analyst's Laboratory and the Water Analyst's Laboratory and the Malaria Laboratory continued to do useful work. Increased volume of work had been turned out during the year and I take this opportunity to reiterate the need for the levy of more deterrent fines to prevent effectively the adulteration of foods. This has been again and again stressed by the Public Analyst in his reports every year and merits consideration by the appropriate authorities. At the time of writing this, the Central Act to prevent food adulteration has come into force and its enforcement, I expect, will be productive of far reaching results.

It is a matter for gratification that during the year the Government took a step in the right direction by establishing beggar homes under the provisions of the Madras City Police Act. This was a long felt need and the Government are to be congratulated on the action they have taken to supplement the steps taken by the Corporation to deal with the beggars in the city. The existence of Government and Corporation Homes for the reception of beggars committed for detention in them under the said act will go a long way in mitigating the nuisance from beggars who constitute a menace to the citizens.

With a view to expand the Work House for able bodied beggars a proposal to abolish the Poor House, a voluntary shelter home particularly for the aged destitutes, by transferring the inmates to the Monegar Choultry was approved by the Corporation Council and accepted by the authorities of the Monegar Choultry. Action was taken to implement the scheme by transferring as many of the inmates as possible from the Poor House to the Monegar Choultry before the end of the year.

As applications for offensive trades are dealt with and disposed of under the provisions of the Madras City Municipal Act, difficulty was often encountered in dealing with applications for such trades in residential areas declared as such under the provisions of the Madras Public Health Act. Wherever licences were sanctioned in such cases by the appellate authorities under the the provisions of the Madras City Municipal Act, the decision of the Government, as directed by them, had to be sought in each and every case.

In G. O. No. 830, Health, dated 10-3-1953, the Government revised the scale of fees for the registration of lodging houses under the Madras Public Health Act and the fees at the enhanced rate were collected from the beginning of 1953-54. In G. O. No. 893, Health, Education and Local Administration, dated 7-4-54, the Government amended the Lodging Houses (Upkeep and Maintenance) Rules, 1940, providing for increased bathing room and latrine accommodation in lodging houses and compulsory installation of automatic



flushing arrangements for latrines in lodging houses in sewerred areas. Action was taken during the year to give effect to the rules as amended.

The insanitation caused by the increasing number of platform dwellers continued to be a problem for the Sanitary Inspectors. They did their best in keeping the road sides and pavements as clean as possible with the co-operation of the Conservancy Staff.

Under the Urban Scheme of the National Malaria Programme, one unit was sanctioned to the Madras State and the State Government included the City of Madras under the Urban Scheme, allotting 0.6 unit, out of the one unit, to the Corporation of Madras. The benefit accruing to the Corporation will be to the tune of Rs. 3.4 lakhs for the operational period of  $2\frac{1}{2}$  years by way of supplies of D.D.T., trucks, anti-malarial drugs, etc. The carrying out of anti-adult work under the scheme is to supplement the anti-larval measures carried out by the Corporation. The implementation of the scheme after acceptance by the Corporation Council on 12-10-54 was pending at the end of the year.

No report on Conservancy is included in this report as the Conservancy Department, separately constituted as an experimental measure from 1-10-53, continued to function under the Conservancy Officer. It finds a place in the Administration Report of the Commissioner of the Corporation.

On behalf of my predecessor, I thank the Commissioner for his able guidance and uniform courtesy and I have to thank the Assistant Health Officers for their fullest co-operation and the other members of the health staff for their good and sincere work.

A. RANGANATHAN, L. M. & S., B. S. SC.  
*Health Officer*

## FORWARDED

The health of the city, as revealed by the report on the vital statistics for the year 1954, was satisfactory. During the year, 59,256 live births were registered in the city, giving a birth rate of 37.12 per mille of the estimated mid-year population, against 54,277 births with a birth rate of 35.20 in the year 1953, which shows an increase in the birth rate. The total number of deaths registered during the year 1954 was 33,181 against 43,753 in the previous year which shows a fall in the death rate from 28.37 per mille in 1953 to 20.78 in 1954, which is the lowest on record. The infant mortality rate also has shown a decrease from 180.28 per 1,000 live births in 1953 to 136.00 in 1954. Yet another gratifying feature was that the maternal mortality rate also showed a fall from 2.78 per 1,000 live births in 1953 to 2.47 in 1954.

The city was comparatively free from epidemics, except for a mild incidence of Cholera and Small-pox.

There was no marked expansion in the medical services provided by the Corporation during the year except that the scheme for rendering medical aid in the extended areas by a Mobile Medical Unit was strengthened by another unit, which was kindly given as a gift by the Andhra Chamber of Commerce.

It is a matter for gratification that during the year, Government established a work house at Melpackam under the provisions of the Madras City Police Act, which has gone a long way to mitigate the nuisance caused by able-bodied beggars in the city. With a view to expand the Work



House for able-bodied beggars, a proposal to abolish the Poor House, a shelter for the aged destitutes by transferring the inmates thereof to the Monegar Choultry, was approved by the Corporation Council and accepted by the authorities of the Choultry. In pursuance of this resolution, 75 out of 150 inmates were transferred from the Poor House to the Monegar Choultry during the year and the remaining others would be taken over to the Monegar Choultry as soon as accommodation is made ready towards which the Corporation has paid Rs. 6,000.

Medical inspection of pupils in the Corporation schools was conducted by the Medical Inspectors. 12,427 boys and 12,498 girls were examined by them during the year. Sharkliver oil and Calcium Lactate were given to those who were under-nourished. As the number of Corporation schools and the number of children studying in them have been steadily increasing year after year, with no corresponding increase in the complement of Medical Inspectors, I have placed a proposal before the Standing Committees and the Council to appoint 3 more Honorary Medical Inspectors.

The Public Health Laboratory, the Public Analyst's Laboratory, the Water Analyst's Laboratory and the Malaria Laboratory continued to do useful work.

The Health and Recreation Centre continued to cater to the health, social and educational needs of the poor families affiliated to it, especially of those living in slums.

The Maternity and Child Welfare Centres, continued to render useful service during the year. There were 34 Child Welfare Centres and 17 of them have maternity wards, with a total strength of 226 beds. Serological examination of blood of antenatal cases was conducted in 10 centres. All positive cases were given free treatment with penicillin supplied by UNICEF. Of the total number of 59,256 births in the city, as many as 29,209 labour cases came under the care and observation of the Child Welfare Scheme and 14,405 births were conducted in the Corporation Maternity wards during the year. These figures will speak of the good work done by these centres. Cows' milk was continued to be supplied to indigent and under-nourished infants in all the centres. The three creches maintained by C.W.S. continued to be popular.

One more family planning clinic was opened in Ashok Vihar during the year, in addition to the 3 clinics which existed already. With the grant-in-aid from Government 6 more family clinics were opened at the C.W. Centres during the current year 1955-56.

The Corporation has a scheme for reorganisation of the child welfare work, which provides for 6 main centres with 50 beds in each, where maternity cases will be attended to instead of at 17 centres with beds ranging from 6 to 34. In order to meet the cost of this new scheme, representations have been made to Government to sanction a grant equal to 25% of the total cost of Maternity and Child Welfare work as is now being given to other local bodies. If the Government favourably consider this request and sanction the grant asked for, the scheme will become an accomplished fact ere long. It is hoped, Government will pass favourable and early orders on this request, as they have been making similar grants to other local bodies in the State for this purpose.

Before closing, I wish to place on record the good work done by the Health Officer and his Assistants and also the Lady Superintendent, Child Welfare Scheme, during the year.

Madras, }  
26-10-54. }

V. N. SUBBARAYAN,  
*Commissioner.*



## VITAL STATISTICS-1954.

### Summary

Area	31900.9920
	Acres or
	49.84 Sq. miles
Population as per census of 1951	14,16,056
Population estimated (Mid Year) 1954	15,96,346
Average density per acre	50.4
Births excluding still births	59,256
Birth rate per 1000 of Estimated population	37.12
Deaths excluding still births	33,181
Death rate per 1000 of Estimated population	20.78
Natural increase	26,075
Rate of natural increase per 1000 of estimated population	16.33
Still births	1,573
Still birth rate per 1000 births (live and still)	25.86
Infant deaths	8,059
Infant death rate per 1000 live births	136.00
Maternal deaths	150
Maternal death rate per 1000 live and still births	2.47

### Deaths from principal causes

Principal causes	Deaths registered from the city	Death rate per 1000 of estimated population.
Cholera	4	0.003
Small-pox	277	0.17
Enteric fever	201	0.13
Malaria	105	0.07
Dysentery and Diarrhoea	4,534	2.89
Tuberculosis including Tuberculosis of Lungs	403	0.25
Respiratory diseases	8,198	5.14

### Public Health of the City of Madras in 1954.

The salient features of the state of Public Health in the City of Madras during 1954 as revealed by the Vital Statistical records of Births and Deaths may be stated as follows:—

- (1) An increase of 6.72 inches of Rain fall over that of the previous year.
- (2) An increase in the birth rate from 35.20 in 1953 to 37.12 per mille in 1954.
- (3) A noticeable reduction in the death rate from 28.37 in 1953 to 20.78 in 1954 which is the lowest rate to be recorded so far in the city.
- (4) An appreciable fall in the Infant mortality rate from 180.28 in 1953 to 136.00 in 1954.
- (5) Decrease in the maternal mortality rate from 2.78 in 1953 to 2.47 in 1954.
- (6) The City was free from Cholera during the year.
- (7) The mortality and rates from the principal causes with the exception of Small-pox were less than those for the previous year.

It would therefore, be evident that during the year under report, the public health of the City of Madras was more satisfactory than it was in the previous year.

### Vital Statistics.

*Area:*—The area of the City is 49.84 Sq. Miles or 31900.9920 acres.

*Meteorology:* — Atmospheric conditions recorded during the year are furnished in Vital Statistics Statement No. I in the Appendix. I

*Rain Fall:*—During the year the rain fall was 44.35 inches in the City as against 37.63 inches of rain in the previous year, the average rain fall for the previous five years being 37.04 inches.

The statement below furnishes the Rain fall in the city in each quarter during the last five years and the year under report.

Year	Rain fall in inches				Total in inches
	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	
1949	—	12 85"	14.94"	10.42"	38.21"
1950	1.26"	4.42"	18.74"	12.09"	36.51"
1951	0.16"	5.42"	11.76"	13.31"	30.65"
1952	0.79"	16.74"	6.49"	18 19"	42.21"
1953	1.42"	0 82"	10.01"	25.38"	37.63"
1954	1.06"	0.29"	18.72"	24 28"	44.35"

*Population:*—The population of the City of Madras according to the census of 1951 was 14,16,056. The estimated mid-year population for 1954 was 15,96,346, the average density per acre being 50.4. The estimated mid-year population has been adopted in calculating the rates for the various statistical statements in the Appendix. I



### Registration of Births and Deaths.

Since 1st April 1868, Registration of Births and Deaths has been compulsory in the city. There are 30 registration centres and Registration is done by trained full time Birth and Death clerks under the Supervision of Ten Medical Officers. Births and Deaths occurring in hospitals, nursing homes, clinics and Child Welfare Maternity wards are reported by the respective authorities in prescribed forms supplied to them. Births and Deaths occurring in residences are reported by the nearest relatives themselves at the respective Registration Centres. Some of the birth and death reports received from the Hospitals, Nursing Homes etc., are still found to be defective. Private Nursing Homes and Clinics are increasing day by day and some of them do not maintain the necessary records for the Births and Deaths occurring in them and do not report these to this Department for making necessary entries in the Corporation registers with the result that much difficulty is felt when the Public require extracts of Births and Deaths which occurred in these institutions. The Director of Medical Services has also been addressed and requested to issue instructions to the Superintendents of State Hospitals to report all the Births and Deaths with correct particulars. The Director of Public Health, Madras has also been addressed seeking his advice for the Registration of Nursing Homes and Clinics in the city and to enforce them to furnish the reports of Births and Deaths with the required particulars.

During the year, the Health Staff detected 617 unregistered Births and Deaths and registered them after warning the defaulters. 12 persons were prosecuted for failure to register births and deaths even after the issue of notices and personal warnings. The fines imposed by the Magistrates for failure to register births and deaths are not sufficiently deterrent to compel the public to do it immediately after the occurrence.

By the recent amendments for the Rules for the Registration of Births and Deaths in G. O. P. S. No. 1180-H., dated 31st March 1953, Births and Deaths not registered within one year after their occurrence can be registered under the orders of a Magistrate, not below the rank of a Magistrate of the 1st class.

*Birth and Birth Rates:*—During the year 59,256 live births (30,182 boys and 29,074 girls) were registered in the city giving a birth rate of 37.12 per mille of the estimated mid-year population against 54,277 births with a birth rate of 35.20 in the previous year. The quinquennial average rate was 44.60. The proportion of male to female births was 104 to 100 against 105 to 100 in 1953. The number of births with the birth rate recorded in each Division in the City is furnished in the Vital Statistical statement No II in the Appendix I.

*Seasonal Variation in Births:*—The number of live births registered during each quarter of the year was as follows:—

Quarter	No. of Births Registered.	Percentage to total Births Registered.
1st Quarter	10,917	18.4
2nd „	13,446	22.7
3rd „	15,941	26.9
4th „	18,952	32.0
<b>Total</b>	<b>59,256</b>	<b>100.0</b>

As in the previous years, the largest number of births was registered during the 4th quarter and the lowest in the 1st quarter.



### Births and Birth Rates in Principal Communities.

The number of live births registered and the birth rates recorded among the principal communities during the year was as follows:—

Community	No. of Births registered.	Rate per 1000 of census population in each community.
Aliens	23	15.00
Anglo-Indians	270	20.38
Indian Christians	2,565	26.90
Muslims	4,796	34.18
Hindus	51,572	44.62
Others	30	3.00
Total ...		41.84

*Still Births:*—During the year under report 1,573 still births were registered against 1,406 in 1953, giving a rate of 25.86 per 1000 live and still births against 25.25 in 1953. The average quinquennial rate was 27.25. The percentage of still births to the total number of live births registered during the year was 2.7.

*Deaths:*—During the year, 33,181 deaths (excluding still births) but including deaths among non-residents were registered in the city against 43,753 deaths in the previous year. Deaths occurring among cases of Infectious diseases admitted into the Infectious diseases Hospital, Tondiarpet, from the adjoining district of Chingleput were also registered in the city. The death rate for 1954 was 20.78 per mille of the estimated mid-year population against 28.37 in the preceding year and the quinquennial average rate of 31.53. The death rate recorded during the year is the lowest to be recorded so far in the city.

An excess of 26,075 births over deaths was recorded during the year against 10,524 excess births in 1953. The rate of natural increase rose to 16.33 from 6.82 in 1953, the highest rate recorded so far in the city.

A statement of births and Deaths registered in the city each year, from 1946 is furnished below showing the natural increase.

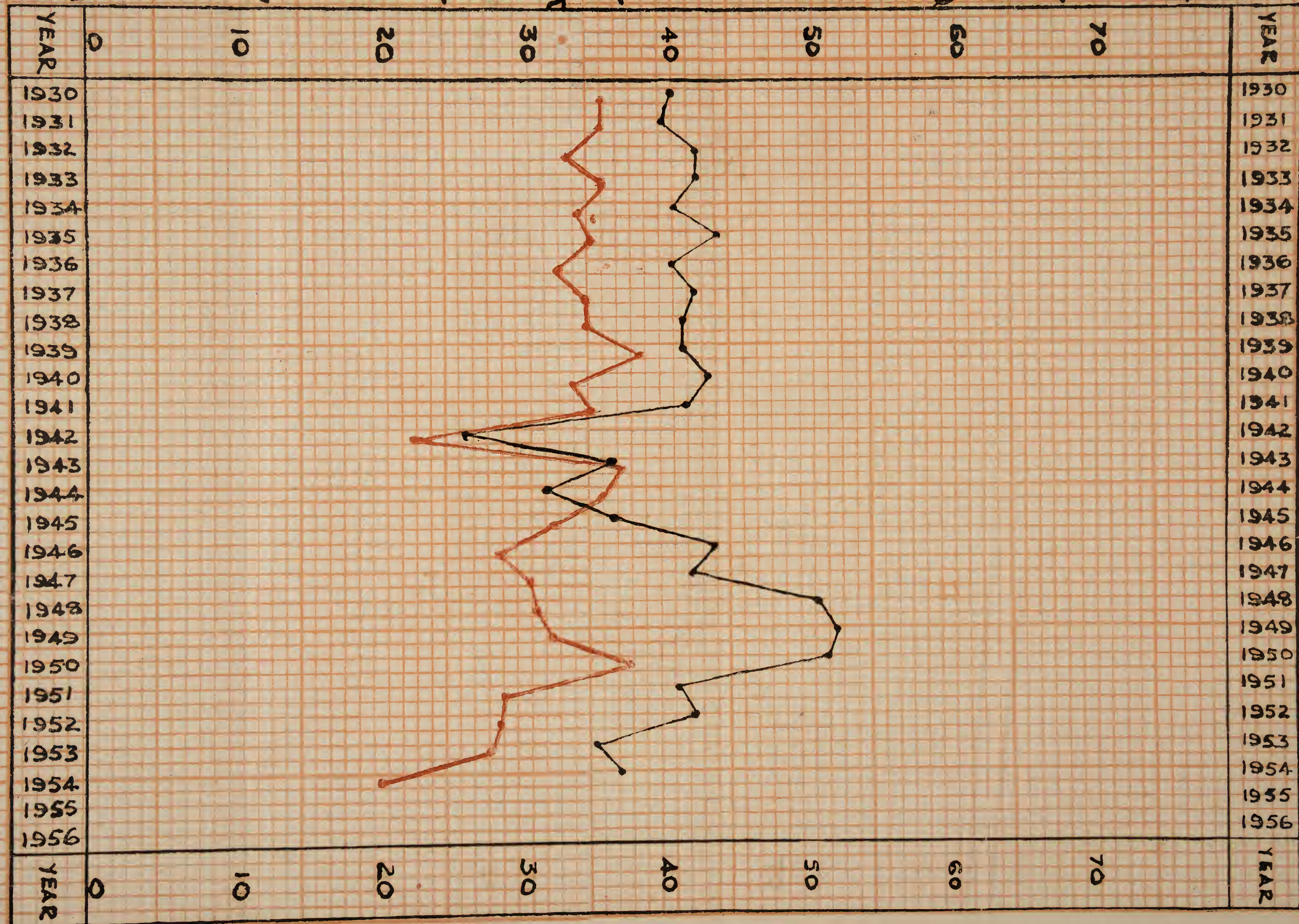
Year	Births	Deaths	Natural increase (+) or decrease (—)
1946	41,874	27,381	+ 14,493
1947	40,753	29,979	+ 10,774
1948	50,222	31,002	+ 19,220
1949	52,362	32,639	+ 19,723
1950	52,619	38,726	+ 13,893
1951	58,961	42,039	+ 16,922
1952	62,921	43,207	+ 19,714
1953	54,277	43,753	+ 10,524
1954	59,256	33,181	+ 26,075



DEATH RATE PER 1000 PERSONS LIVING

BIRTH RATE PER 1000

DIAGRAM  
ANNUAL BIRTH AND DEATH RATE IN MADRAS CITY  
BIRTHS ——— 1930-1954 DEATHS ———

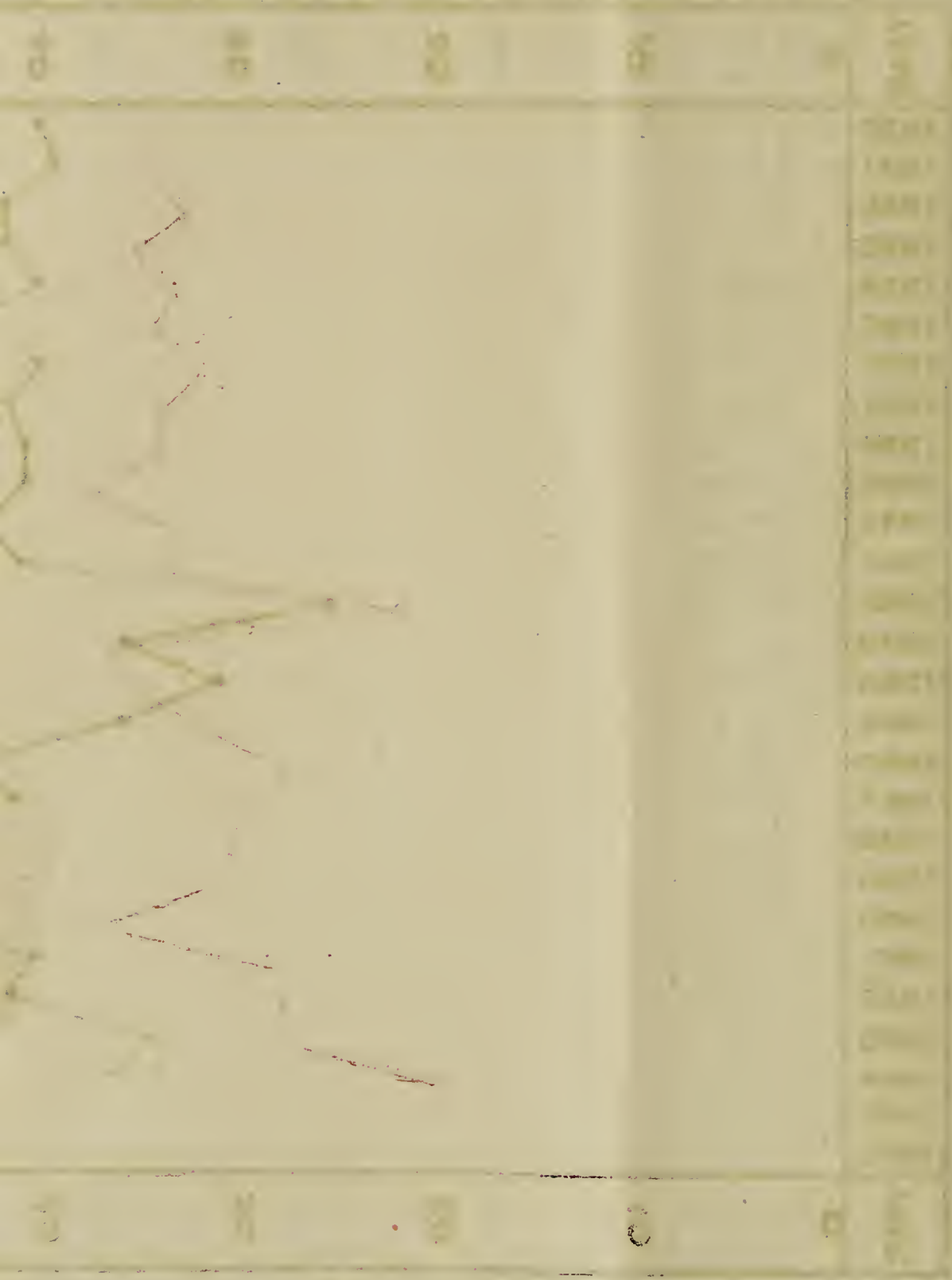


SCALE: 1/5 INCH = YEAR

SCALE: 1 INCH = 10 NUMBERS



U.S. GEOLOGICAL SURVEY



Geological cross-section

Scale of feet



*Seasonal Variation:*—The number of deaths registered in the city during each quarter of the year was as follows:—

Quarter	No. of deaths registered.	Percentage to total deaths.
1st quarter	8,389	25.28
2nd „	7,298	22.00
3rd „	8,893	26.80
4th „	8,601	25.92
Total	... 33,181	100.00

The number of deaths registered in each division with the death rates is furnished in Vital Statistical statement No. IV in the Appendix I.

*Deaths and Rates in Principal Communities:* — The principal communities recorded deaths and death rates during the year as noted below:—

Community	No. of Deaths registered.	Rate per 1000 of census population in each community.
Aliens	14	9.13
Anglo Indians	133	10.04
Indian Christians	1,534	16.08
Muslims	3,554	25.33
Hindus	27,941	24.18
Others	5	0.50
Total	... 33,181	23.43

Vital Statistical statement No. IX in the Appendix I furnishes the No. of deaths and death rates among the principal communities in the city during the year as compared with the figures for the previous year. Of the total of 33,181 deaths registered during the year 17,280 were among men and 15,901 among women. As in the previous years the male deaths predominated over female deaths, the ratio being 109 to 100.

Excess of deaths over births recorded in Dn. 28 was due to the deaths among non-residents admitted into the Government General Hospital during the year.

The specific rates of deaths among males and among females during the year were the same viz 23.4 per mille.

*Age at Death:*—The statement below furnishes the number of deaths among the various age groups and the percentage of deaths to the total mortality in each age group.

Age period	Number of deaths.	Percentage to total deaths.
Under one year	8,059	24.2
1 year & under 5 years	8,116	24.5
5 years & „ 10 „	1,456	4.4
10 „ & „ 15 „	553	1.7
15 „ & „ 20 „	692	2.1
20 „ & „ 30 „	2,151	6.5
30 „ & „ 40 „	2,001	6.0
40 „ & „ 50 „	2,094	6.3
50 „ & „ 60 „	2,457	7.4
60 Years and above	5,602	16.9
Total	... 33,181	100.0

Vital statistical statement No. VI in the Appendix I furnishes the deaths registered among various age groups during the year.

*Infant Mortality*:—Deaths among infants under one year of age during the year numbered 8,059 which was 1,726 less than the figure for the previous year and 1560 less than the average figure for the previous five years. The infant mortality rate of 136·00 per 1000 live births for the year is the lowest rate recorded so far. It compares very favourably with 180·28 for 1953 and the quinquennial average rate of 171·39. The Infant mortality rates recorded from 1946 to 1954 in the city are furnished below :—

Year.	Infant Mortality rate per 1000 live births.	Year.	Infant Mortality rate per 1000 live births.
1946	183·00	1950	187·73
1947	195·99	1951	166·57
1948	155·97	1952	163·82
1949	158·59	1953	180·28
		1954	136·00

The Infant mortality among the different age groups during the year was as follows :—

Age Groups.	No. of Infant Deaths.	Percentage to Total Infant Deaths.
Under 7 days ...	2,005	24·88
7 days and under 1 month ...	1,076	13·35
1 month & under 6 months...	2,589	32·13
6 months & under 1 year ...	2,389	29·64
Total ...	8,059	100·00

The Infant mortality and its rate among the principal communities were as follows :—

Community.	No. of live births registered.	No. of infant deaths.	Infant mortality rate per 1000 live births registered.
Aliens ...	23	2	87·00
Anglo Indians ...	270	10	37·04
Indian Christians ...	2,565	314	122·42
Muslims ...	4,796	944	197·00
Hindus ...	51,572	6,789	131·64
Others ...	30	...	...
Total ...	59,256	8,059	136·00

Vital Statistics statement No. VIII in the appendix I gives the number of Infant deaths with rate registered in each month during the year compared with the figures for 1953. The number of Infant deaths registered in each division with infant mortality rate is furnished in vital statistics statement No. IV in the appendix I. High rates of infant death occurred in the divisions which are congested and where the poorer classes are preponderant.

*Causes of Infant Deaths*:—It will be seen from the Vital Statistics statement No. XI in the appendix I that 5,070 deaths or nearly 63% of the total infant deaths were due to premature birth, infantile Debility and diseases of the respiratory system against 6,120 deaths or 62·5% in the previous year. Dysentery and diarrhoea caused 1,008 deaths. 347 deaths were due to fever and convulsions caused 414 deaths. Deaths from small-pox numbered 40.



1920-1921

WATER RESOURCES

STATION NO. 1000

DATE 10-10-21

TIME 10:00 AM

PLACE

NO. 1000

DATE 10-10-21

TIME 10:00 AM

PLACE

NO. 1000

DATE 10-10-21

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DATE 10-10-21

TIME 10:00 AM

PLACE



# DIAGRAM ANNUAL INFANTILE MORTALITY RATE IN MADRAS CITY 1930-1954

DEATH RATE PER 1000 LIVE BIRTHS



SCALE: 1 INCH = 50 NUMBERS

SCALE: 1/5 INCH = 1 YEAR



*Deaths from Principal Causes*:—The following table furnishes the number of deaths from principal causes together with the percentage to the total number of deaths registered during the year and death rates per 1000 of estimated mid year population:—

Principal causes of death.	No. of deaths registered.	Percentage to total deaths registered.	Rate per 1000 of estimated mid year population.
Cholera ...	*7	0·02	0·004
Small pox ...	*305	0·92	0·20
Measles ...	5	0·02	0·003
Enteric fever ...	*234	0·70	0·15
Malaria ...	*105	0·32	0·07
Other fevers ...	3115	9·39	2·00
Dysentery and diarrhoea ...	4534	13·66	2·89
Tuberculosis including tubercule of lungs ...	403	1·21	0·25
General respiratory diseases.	8,198	24·71	5·14
Injuries ...	488	1·47	0·31
Deaths from child birth ...	150	0·45	0·10
All other causes ...	15,637	47·13	9·80
Total ...	<u>33,181</u>	<u>100·00</u>	<u>20·78</u>

\* Includes deaths of non-residents among Mofussil cases admitted into the city hospitals.

During the year the mortality and the mortality rates from cholera, other fevers, dysentery and diarrhoea, tuberculosis, general respiratory diseases, injuries, child birth and other causes were less when compared with the respective figures for the previous year and the average rates for the quinquennium (1949-1953)

### Control of Communicable Diseases

*Notification*:—Under the Madras Public Health Act, 1939, the following are the notified infectious diseases in the city of Madras:—(1) Plague, (2) Cholera, (3) Small pox, (4) Measles, (5) Chicken pox, (6) Diphtheria, (7) Enteric fever or typhoid, (8) Cerebro spinal fever, (9) Leprosy, (10) Rabies, (11) Scarlet fever, (12) Typhus, (13) Yellow fever, (14) Kalaazar, (15) Tuberculosis and, (16) Influenzal pneumonia. Though these diseases have to be notified to the Health Department for taking necessary preventive measures, notification of the occurrence of such cases had been very poor and continued to be unsatisfactory.

*Plague*:—The city continued to be free from plague.

*Cholera*:—The city was practically free from cholera during the year. There were in all 39 attacks and 4 deaths from it against 3,872 attacks and 602 deaths in the previous year. The death rate was 0·003 per mille against 0·39 in the previous year and the quinquennial average rate of 0·20. Deaths from Cholera accounted for 0·01 per cent of the total mortality. Preventive measures such as isolation, disinfection, chlorination of wells and inoculation of contacts were promptly adopted. 62,940 persons were inoculated with anti cholera vaccine during the year.

As usual cases of cholera from the adjoining district of Chingleput were removed to the Infectious Diseases Hospital, Tondiarpet, for isolation and treatment. 43 cases were treated for cholera of which 3 proved fatal.



*Small pox* :—Small pox was prevalent in a sporadic form in the city through out the year. Attacks and Deaths recorded during each quarter of the year are furnished below :—

Quarter.	Attacks & Deaths Recorded in the City.			Cases Brought from Chingleput District.		
	A.		D.	A.		D.
1st	565	—	119	18	—	5
2nd	272	—	69	23	—	7
3rd	148	—	42	22	—	6
4th	229	—	47	44	—	10
Total ...	1,214	—	277	107	—	28

A total of 1,214 attacks and 277 deaths from Small-pox were recorded in the city during the year against 517 attacks and 96 deaths in the previous year. The death rate was 0·17 per mille of the estimated Mid year population as compared with a death rate of 0·06 in 1953 and the quinquennial average rate of 0·32. Deaths from Small-pox accounted for 0·8 per cent of the total mortality. Prompt preventive measures were adopted in all cases notified or detected. The infected houses were disinfected, as also infected clothes and other articles of the patients. All the contacts were revaccinated. House to house inspection to detect concealed or suspected cases was conducted and vaccination was pushed on in the infected localities. Schools, firms, factories, offices and other public institutions in the city were visited by the staff and revaccination was performed on a large scale. A wide propaganda was made giving publicity to the prevalence of Small-pox and to the method of its prevention by the distribution of pamphlets, by conducting magic lantern shows and lectures and through communiques in the press. Intimations were sent to the Health authorities concered in all casses of imported infection.

Almost all the cases were hospitalized. 14 persons were prosecuted during the year for failure to report the incidence of Small-pox to the Health authorities as required by section 345 of the Madras City Municipal Act.

Vaccinations and revaccinations performed during the year are given in a separate report. The number of Small-pox cases isolated and treated during the year is given in the report on the Infectious diseases Hospital, Tondiarpet.

During the year 582 persons were admitted into the Infectious Diseases Hospital, Tondiarpet, for different infectious diseases from the adjoining district of Chingleput for isolation and treatment. It is once again stressed that the District Health authorities and the Government might take immediate steps to make arrangements for the isolation of infectious diseases with in the District in the interest of Publie Health of the city and in views of the risk involved in removing the patients from the district.

*Measles* :—5 deaths from Measles, including one death from mufussil cases were registered during the year with a death rate of 0·003 per mille.

*Typhoid or Enteric Fever* :—Enteric Fever was prevalent in the city through out the year in a sporadic form. Though, this is a notifiable disease under the provision of the Madras Public Health Act, it's notification by the Hospitals and private Medical practitioners still continues to be very poor.

During the year 1140 cases and 201 deaths from Enteric Fever were registered in the city against 1064 cases and 186 deaths in the Previous year. The death rate was 0·13 per mille against 0·12 in 1953. The quin.



quennial (1949-1953) average rate was 0.19. Enteric Fever accounted for 0.6 per cent of the total mortality during the year. The incidence of the disease during the different quarters of the year was as follows:—

Quarter.	Attacks. Deaths.		Cases admitted into the city Hospitals from the Adjoining district of Chingleput for Treatment.	
			Attacks.	Deaths.
1st Quarter...	318	51	42	9
2nd „ ...	78	46	18	8
3rd „ ...	279	61	37	5
4th „ ...	465	43	112	11
	—	—	—	—
Total ...	1,140	201	209	33
	—	—	—	—

Preventive measures were promptly adopted in respect of every case notified. The infected houses and clothes and materials were disinfected. All the contacts were inoculated with anti Typhoid vaccine, during the year 27,330 persons were protected against the disease.

*Malaria*:—Malaria caused 105 deaths during the year against 96 deaths in 1953. The death rate was 0.07 per mille against 0.06 in 1953. The quinquennial (1949-53) average rate was 0.12. Malaria accounted for 0.3 per cent of the total mortality in the city.

Details of the work done by the Anti Malarial Staff are given in a separate report.

*Kalaazar*:—During the year 34 deaths from Kalaazar were registered in the city against 41 deaths in the previous year. The death rate was 0.02 per mille against 0.03 in 1954. “Kalaazar” has also been declared a notifiable disease in the city.

*Other Fevers*:—Under this cause, deaths from causes other than Malaria, Tuberculosis, Enteric Fever and Respiratory diseases with fever as the predominant symptom are included. 3,115 such deaths were registered during the year with a death rate of 2.00 per mille against 4,684 deaths with a death rate of 3.04 in the previous year. The quinquennial (1949-53) average rate was 2.57. The deaths under this group accounted for 9.4% of the total mortality against 10.7% in 1953.

*Dysentery & Diarrhoea*:—Dysentery and Diarrhoea accounted for 4,534 deaths. This figure for the year is 1657 deaths less than that for the previous year. The death rate was 2.84 per mille of the estimated mid year population, against 4.04 in 1953 and the quinquennial (1949-53) average of 4.02 per mille.

Dysentery and Diarrhoea accounted for 13.7% of the total mortality in the city.

*Tuberculosis*:—Tuberculosis including Tubercle of Lungs caused 403 deaths during the year with a death rate of 0.25 per mille against 471 deaths and a death rate of 0.31 in the Previous year and the quinquennial average rate of 0.57. Deaths from Tuberculosis accounted for 1.2 per cent of the total mortality.

The Health Staff inspected and disinfected the houses of all cases notified and prevailed upon the contacts and relatives of the patients to get themselves examined and treated. Pamphlets on Tuberculosis with special reference to its prevention were distributed to them.



The Health visitors attached to the Tuberculosis clinics in the city visited the houses of the patients and advised the patients and their relatives as to the care of sputum, ventilation, diet, clothing and general sanitation. The Health Visitors revisited the patients and the contacts in their houses from time to time through out the year as part of their follow-up work, records of which are maintained by the Health visitors. Notification of Tuberculosis cases treated by the private Medical Practitioners continued to be very poor.

Details of cases treated at the Corporation Tuberculosis Hospital and at the Several Clinics are furnished separately in the Report.

*General Respiratory Diseases:—* During the year, 8198 deaths under this group were registered as against 10,010 deaths in the previous year. The death rate was 5.14 per mille against 6.50 in 1953 and the quinquennial (1949-53) average rate of 7.43.

Deaths under this group accounted for 24.7 per cent of the total mortality in the city. The mortality figures under this head of causes of death from 1946 to 1954 with the death rates are given below:—

Year.	No of deaths registered.	Death rate calculated on the Estimated mid year Population.
1946	5,878	6.16
1947	6,803	7.03
1948	7,237	7.36
1949	8,072	8.09
1950	8,918	8.80
1951	9,933	6.93
1952	10,137	6.81
1953	10,010	6.50
1954	8,198	5.14

It will be seen from the above that there has been a gradual decrease in the death rate year after year since 1950 and the death rate recorded during the year is the lowest recorded rate in the city so far. Vital Statistics statement No. VII in the appendix I gives the number of deaths registered under this group in each Division during the year. High mortality have occurred in the divisions which are congested and where labouring and poor classes live in poverty and defective housing conditions and in ignorance of hygienic principles.

*Injuries:—* During the year 488 deaths due to Suicide, Drowning, Wounds, Accidents, Poisonous bite, etc. were registered in the city during the year against 525 such deaths in 1953. The death rate was 0.31 per mille against 0.34 in the previous year. The quinquennial (1949-53) average rate was 0.32 per mille.

Deaths from "Injuries" accounted for 1.5. per cent of the total mortality.

Under the Rules for the Registration of deaths the police authorities are required to furnish inquest reports in the prescribed form to this Department soon after inquests are made in all cases of suspicious deaths. But these inquest reports are not being furnished regularly for all such deaths. The Commissioner of Police, Madras has also been addressed in the matter requesting him to instruct the officials concerned to furnish the inquest reports in all such deaths regularly and without delay.



*Maternal Deaths*:—150 mothers died from causes connected with child bearing in the year as compared with 155 mothers in 1953. The maternal death rate during the year was 2·47 per 1000 live and still births against 2·78 in 1953 and the quin quennial (1949-53) average rate of 2·48. The deaths of mothers from child birth during the year are classified below according to age groups and principal causes of death:—

Causes of Death	Under 20 yrs.	20 years and under 30 years.	30 years and under 40 years.	40 years and above	Total deaths	Percentage to total deaths from child birth.
Puerperal Sepsis ...	1	17	8	1	27	18·00
Abortion ...	2	11	4	2	19	12·67
Other accidents of pregnancy ...	21	42	38	3	104	69·33
Total ...	24	70	50	6	150	100·00

Details relating to the deaths of mother who came under the care of the various clinics of the Child Welfare Scheme are given in the Report of the Lady Superintendent Child Welfare Scheme.

*Certified Deaths*:—During the year 8,806 deaths were certified by the various Hospitals and clinics and Institutions in the city. 504 deaths were certified by Private Medical Practitioners as to the causes of death. The certified deaths represented 28 per cent of the total deaths during the year. Medical officers in charge of Registration of Births & Deaths verified the causes of the other deaths. The percentage of certified deaths by the private medical practitioners continued to be poor and unsatisfactory.

## VACCINATION

Ten Medical Officers designated as Sub-Assistant Health Officers were in charge of the Vaccination during the year. They were assisted by 72 male vaccinators, 8 lady vaccinators and 27 Birth and Death Registration clerks who were also trained in vaccination work. The Birth and Death clerks performed vaccinations at the vaccination Depots only during the absence of the vaccinators from the Depots. Vaccinations were also done at the Corporation Dispensaries, Corporation Schools and at the Child Welfare Centres by their respective Medical Officers. Sanitary Inspectors also performed Vaccinations among the contacts of Small-Pox and other Suspicious causes and were responsible for the protection of those employed in licensable trades. Vaccinations and Inoculations were also done at the Vital Statistical section in the Health Department at the Ripon Buildings between the hours 11 A.M. and 5 P.M. On all working the for the convenience of those who required them urgently during non-working hours of vaccination depots. 31 Public vaccination centres were functioning in the city during the year.

*Vaccination*: — Vaccination is compulsory in the city under the bylaws framed under Section 349 (26) of the Madras City Municipal Act from the age of Six months During the year, the Vaccination Staff contacted the parents of all babies born in the city for the purpose of vaccination. By intensive house to house inspection, they were able to detect 11,037 babies born in Mofussil and brought to the city without being vaccinated.

During the year 50,148 primary vaccinations were performed in the city against 51,193 primary vaccinations in 1953. The success rate in primary vaccination during the year was 99.9%.



3,59,628 revaccinations were performed in the city during the year against 2,22,504 revaccinations in 1953. The success rate in revaccination was 4.8%.

There was a fall in the number of primary vaccinations during the year due to the lesser number of births registered in the previous year.

The Statement below furnishes the number of births registered and the primary vaccinations performed in the City, each year from 1946.

Year.	Total No. of live Births registered during the 12 months ending on 30th June.	Primary vaccinations performed.	Percentage of successful vaccinations.	No. of revaccinations performed.	Total No. of vaccinations performed.
1946	35,531	33,517	99.9	2,95,226	3,28,743
1947	42,560	37,468	99.9	1,27,682	1,65,150
1948	41,687	36,250	99.9	97,565	1,33,815
1949	52,966	46,266	99.9	3,39,418	3,85,684
1950	53,499	56,804	99.9	9,05,402	9,62,206
1951	53,826	52,027	99.9	4,06,292	4,58,319
1952	59,881	52,520	99.9	2,37,951	2,90,471
1953	61,310	51,193	99.9	2,22,504	2,73,697
1954	55,062	50,148	99.9	3,59,628	4,09,776

The results of 38,700 primary vaccinations and 97,924 revaccinations were verified by Inspecting Officers during the year. The remaining cases were verified by the vaccination Inspectors themselves.

During the year 1,076 children were certified as unfit for vaccination under Medical advice.

153 persons were prosecuted under Section 349 (26) of the Madras City Municipal Act during the Year for failure to get their children vaccinated and 29 persons for failure to get themselves revaccinated.

No serious ill effects due to vaccination were observed or reported during the year.

International certificates of vaccination against Small-pox and inoculation against Cholera were issued for International Sea and Air traffic on payment of fees of Rs. 5 for each person till 1-7-54. Under instructions from the Government of India, Ministry of Health, New Delhi in their letter No. F. 12-5/52 P. H. dated 12-6-54 these certificates are issued free of charge from 1-7-54. During the year, 4,831 certificates were issued in the International forms.



The Vaccinal conditions of Small-pox cases recorded by the Health Staff during the year are shown below:—

Age period.	Vaccinated as evidenced by at least one successful mark.		Not vaccinated and vaccinated during incubation period or said to have been vaccinated but without successful marks.		Case fatality rate among.	
	Attacks.	Deaths.	Attacks.	Deaths.	Vaccinated.	Unvaccinated.
Under one Year ...	2	0	79	39	—	49
1 to 5 years ...	23	5	154	80	22	52
5 to 10 .. ...	26	3	114	38	12	33
10 to 15 .. ...	63	2	40	6	3	15
15 to 20 .. ...	114	4	45	11	4	25
20 to 25 .. ...	193	16	40	18	8	45
25 to 30 .. ...	157	18	22	11	11	50
30 to 35 .. ...	66	8	16	7	12	44
35 to 40 .. ...	52	9	14	8	17	57
40 to 45 .. ...	26	4	10	4	15	40
45 to 50 .. ...	25	3	3	1	12	33
50 years and above ...	27	3	10	5	11	50
Total ...	774	75	547	228	10	42

The total includes 107 cases of Small-pox admitted into the Infectious diseases Hospital, Tondiarpet from the adjoining District of Chingleput during the year.

As usual the students of the Sanitary Inspector Course of the Madras Medical College and of the Stanley Medical College, apprentice physicians and Village Vaidya Trainees of the College of Indigenous Medicine, Kilpauk and the Students of the Christian Medical College, Vellore were posted for training in Vaccination under the Medical Officers in charge of vaccination during the year.

Details of vaccinations performed in the City during the year are furnished in Statements in the Appendix I to the report.

### MEDICAL RELIEF

There were 33 general dispensaries consisting of 25 of the Allopathic system and 8 of the indigenous system affording free treatment for minor ailments. They were located in various parts of the city to cater to the needs of the surrounding locality. There were also 5 special clinics for Tuberculosis, two for leprosy and one for venereal clinic. The Infectious Diseases Hospital at Tondiarpet continued to attend to the treatment of cases of infectious diseases occurring in the city as well as in the adjoining district of Chingleput. The Tuberculosis Hospital continued to attend to cases of Tuberculosis requiring institutional treatment.



The Public Health laboratory behind Ripon Buildings and the Ashok Vihar Health and Recreation Centre in the People's Park, continued to do useful work in the spheres of their activity.

*General Dispensaries*:—The general dispensaries recorded a total attendance of 33,93,378 of which 15,39,142 were new cases. The number of minor operations performed was 8,736. The Ayurvedic dispensary for women and children at Thousand lights treated 97,258 cases, the number of new cases being 46,355.

Scheme of service by mobile medical unit inaugurated in 1953 was further extended from May of the year under report. Another van gifted by the Andhra Chamber of Commerce for the purpose was put into use and free medical facilities were rendered to the residents in outlying areas, particularly in the west of the city not within easily accessible distances from the general dispensaries. The van gifted in the previous year by Motor Spare Parts Dealers Association continued to serve the needs of the poorer sections of the population in Kodambakkam and Adyar while the newly gifted van rendered such assistance in Perambur, Sembium and Ayanavaram. Selected areas in these divisions were visited every week in the afternoons for rendering medical assistance to the patients numbering 33,609 of which 31,658 were new cases. The Medical officers of the general dispensaries at Perambur, Sembiam, Kodambakkam and Adayar accompanied the van by turns with necessary ancillary staff. This necessitated the closure of general dispensaries in the afternoons on the days the Medical Officers and the ancillary staff in charge of them had to go with the mobile medical units.

Details of places visited by these two mobile medical units are given below :—

#### Van gifted by the Motor Spare Parts Association

Name of places visited.	Days on which visits were made.	Time of service.	Remarks.
Alcottkuppam	... Mondays	3 to 4 P.M.	
Vannandorai	... „	4-15 to 4-45 P.M.	
Damodarapuram	... „	4-45 to 5-30 P.M.	
Namaswayapuram	... Tuesdays	4 to 6 P.M.	
Choolaimedu	... „	„	
Kalikundram	... Wednesdays	3 to 4 P.M.	Total number of new and old cases treated in the year under report is 20,615.
Pallipet	... „	4-15 to 4-45 P.M.	
Maduvankarai	... „	4-45 to 5-30 P.M.	
Kodambakkamcheri	... Thursdays	4 to 6 P.M.	
Narayanakuppam	... „	„	
Kotturcheri	... Fridays	3 to 4 P.M.	Total number of new cases treated in the year under report is 19,320.
Varadapuram	... „	4-15 to 4-45 P.M.	
Zamin Adyar	... „	4-45 to 5-30 P.M.	
Jaffarkuppam	... Saturdays	4 to 6 P.M.	
Mambalam cheri	... „	„	

#### Van gifted by the Andhra Chamber of Commerce

Name of places visited	Days on which visits were made.	Time of service.	Remarks.
Naduvankarai	... Mondays	4 to 6 P.M.	Total number of new cases treated during the year under report is 12,338.
Periakudal	... „	„	
Arumbakkam cheri	... „	„	
Nadukarai cheri	... „	„	





New Veterinary Dispensary at Kodambakkam.



New dispensary opened at Muthialpet opposite to the Police Station.







Name of places visited.	Days on which visits were made.	Time of service.	Remarks.
Kulathur village	... Tuesdays	4 to 6 P.M.	
Erukancheri	... Wednesdays	4 to 6 P.M.	Total number of new and old cases treated during the year under report is 12,994.
Aminjikarai cheri	... Thursdays	4 to 6 P.M.	
Arumbakkam village...	... „	... „	
Shanarpalayam	... „	... „	
Ponnuvelu Pillai Thottam	... „	... „	
Periakudal	... Fridays	4 to 6 P.M.	
Thandavarayan chatram	... „	... „	
Arasupillai Street	... „	... „	
Madavaram village and cheri	... Saturdays	4 to 6 P.M.	

### SPECIAL CLINICS

#### *Leprosy Clinics :—*

The Leprosy clinics at Triplicane and Vyasarpady continued to function in the City during this year in pursuance of the Anti-Leprosy Scheme.

During the year, the clinics registered a Total attendance of 67,999 cases inclusive of 18,757 new cases of skin and Leprosy. Of these 1,465 were new cases of Leprosy. 298 cases representing 20·3% were defective. 26,565 injections for cases of Leprosy and 642 for skin cases were given. The average monthly attendance at the clinics was 6,000.

The following is the details of the working of the two clinics :—

Location of the Clinic.	New cases of Leprosy.	New skin cases.	Yearly attendance of skin and Leprosy cases	Number of injections for Leprosy.	Number of injections for skin cases.	Average monthly attendance.
Besant Road, Triplicane ...	362	14,594	35,711	7,576	642	2,976
Vyasarpady ...	1,103	2,698	32,288	18,989	Nil	2,691

Leprosy survey work was continued during this year also. The Medical Officers had the assistance of Health visitors. In all the cases detected, necessary advice were given as to how they could all be made symptoms free in early stages by proper and upto-date treatment. The open cases were advised on proper segregation.

The proposal for the establishment of a Leprosorium for such segregation did not materialise. Yet, provision for accommodating 36 patients in the Government Sanatorium, Tirumani by the Corporation helps the Corporation to go a long way in deporting certain advanced cases from the city to the Sanatorium. The Corporation paid a capitation charge of Rs. 50 per month per bed utilised.

In the case of School children found to be suffering from Leprosy, arrangements were made to give them necessary treatment. In this respect close co-operation was maintained between the school medical service and the Medical Officer in charge of the clinics. 442, school children of 14 Corporation schools attended the Corporation Leprosy clinic, Triplicane and under-went treatment for Leprosy. Of these 54 were new cases and 388 were old cases. 820 injections were given for these children.



## TUBERCULOSIS CONTROL

A Tuberculosis Clinic at Pulianthope High Road, maintained by the Corporation from 1946 is equipped with a laboratory, X-ray facilities etc., with complete diagnostic appurtenances. The staff consisted of 2 Medical Officers, one Health Visitor and other ancillary staff. Cases diagnosed at the Clinic and needing institutional treatment were sent to the Tuberculosis Hospital maintained by the Corporation at Kunnur High Road :

P. T. Stage	I	17
"	II	50
"	III	1,193
Total ...		<u>1,260</u>

## Age Distribution of P. T. Cases

Age groups.	No. of cases.
1 to 5	40
6 to 10	17
11 to 15	27
16 to 20	134
21 to 25	274
26 to 30	239
31 to 35	142
36 to 40	122
41 to 45	83
46 to 50	93
51 to 55	41
56 to 60	35
Above 60	13
	<u>1,260</u>

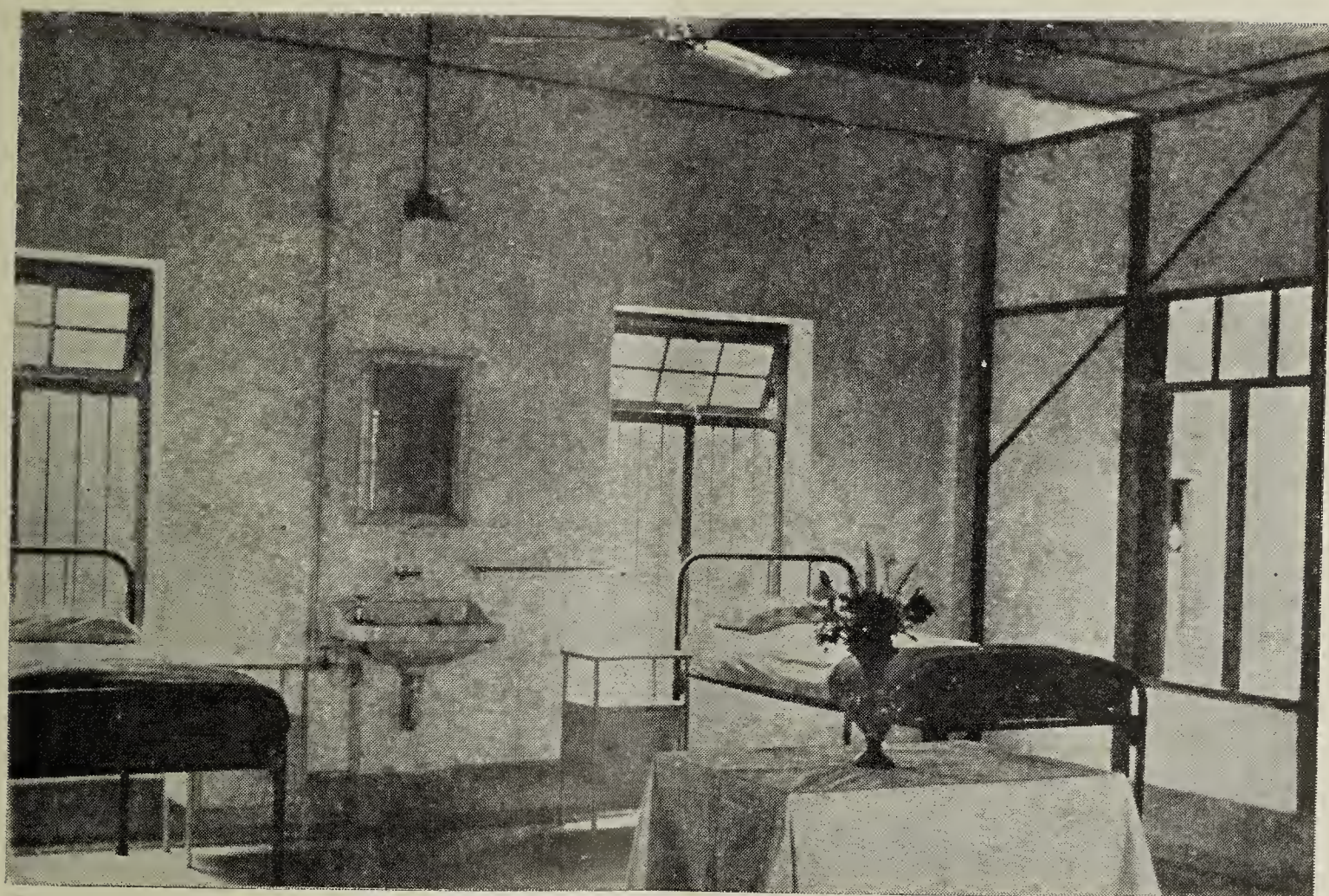
## Regional Distribution.

Preventive control area of the Clinic.	No. of cases in 1954.
Pulianthope	214
Choolai	236
Perambur	139
Sembiam	100
Kosapet	173
Vyasarpady	63
Ayanavaram	45
Total diagnosed at the Clinic	970
Cases transferred from other clinics	205
Total number of Pulmonary Tuberculosis cases attending the clinic from the preventive control area	1175
No. of cases belonging to other areas diagnosed at this clinic and transferred to other clinics for Home Visiting	290

*Laboratory Fluroscopic and Radiographic Examinations :—*

No. of sputum examined	4156
Fluroscopic examinations	11015
No. of Radiographs taken	848





Extensions to the T. T. Hospital, Konnoor High Road.







Home visits by the Health Visitor and Contact examinations during last 5 years :

	1950	1951	1952	1953	1954
Primary Home visits ...	936	1069	1130	1002	869
Re-visits ...	233	205	212	250	214
Visits to discharged patients from the Hospital after cure ...	357	298	255	372	297
<b>Total visits by the Health Visitor ...</b>	<b>1,526</b>	<b>1,572</b>	<b>1,597</b>	<b>1,624</b>	<b>1,380</b>
No. of contacts examined at the clinic at the instance of the Health Visitor during last 5 years ...	1,208	1,274	1,845	1,787	1,287

(Out of 1,287 contacts examination 1,204 contacts were from the preventive control area.)

#### P. T. Cases among Contacts.

	Among Contacts in General.	Among contacts from the preventive control area.
P. T. Stage I	21	21
P. T. Stage II	6	4
P. T. Stage III	34	31
	<u>61</u>	<u>56</u>

Showing No. of Contacts Tuberculin Tested and B.C.G. Vaccinated :

No. of contacts Tuberculin Tested ...	1245
„ Positive ...	496
„ B. C. G. Vaccinated ...	185
No. of contacts not responded for vaccination.	564

#### Treatment of cases.

##### 1. Artificial Pnuemothorax :—

(a) No. of cases for whom A. P. was tried at the clinic as out patient ...	60
(b) No. of cases who got A. P. as continuation of treatment after discharge from the Hospital and from other institutions ...	65
(c) No. of cases brought over from the previous year who continued A. P. at the Clinic (treatment done as out patient only) ...	7

Total No. of patients who had A. P. at the Clinic ...	<u>132</u>
---	------------

##### 2.

(a) No. of cases in whom A. P. failed for want of free pleural space ....	11
(b) No. of cases for whom A. P. was abandoned at various stages during the year as being either contraselective or on account of complications developing ...	16



(c) No. of A. P. cases who discontinued treatment against medical advice	...	12
(d) No. of cases of A. P. admitted into the Hospital in a better condition of continuing treatment	...	29
(e) No. of cases for whom A. P. was abandoned during 1954 at the end of successful treatment	...	36
(f) No. of cases who continued treatment till the end of 1954	...	21
		<hr/>
Total	...	125

3. *Pneumo Peritoneum* :—

(a) No. of cases for whom P. P. was induced at the Clinic	...	57
(b) No. of cases for whom P. P. was continued at the Clinic as continuation of treatment after discharge from the Hospital or other Sanatoria	...	49
(c) No. of cases brought over from the previous years who continued P. P. (Treatment as out patient only)	...	41
		<hr/>
Total No. of P. P. cases	...	147

(d) No. of cases for whom P. P. was abandoned at various stages as being ineffective or account of complications setting in	...	11
(e) No. of cases who discontinued P. P. against Medical advice at some stage or other	...	29
(f) No. of cases admitted into Hospital and other sanatorium with P. P.	...	5
(g) No. of cases for whom P. P. was abandoned at the end of successful treatment	...	10
(h) No. of cases for whom P. P. was continued till the end of 1954	...	92
		<hr/>
Total	...	147

4.

(a) No. of initial A. P's given	...	60
(b) No. of initial P. P's given	...	57
(c) No. of A. P. Refills given	...	1,083
(d) No. of P. P. Refills given	...	2,453
(e) No. of air aspirations	..	1
(f) No. of injections including streptomycin and other injections by way of symptomatic treatment	...	2,132

5. *Statement showing admission in the hospital* :—

(a) No. of cases diagnosed during the year 1954	....	1,260
(b) No. of cases put on the waiting list on their first appearance at the clinic	...	358
(c) No. of cases approved for admission including special wards and emergency cases	...	181
(d) No. of cases actually responded and admitted.		148
(e) No. of cases admitted from the preventive control area	...	112



*Financial assistance*:—18 deserving cases from the preventive Control area received financial aid of Rs. 20 per month each, from the Tuberculosis Association of Madras. The total financing aid given amounted to Rs. 360 during the year.

Four more clinics sanctioned in G. O. No. 809 P. H., dated 14-3-1950 and opened in the year 1950, continued to function efficiently. They were located one each, in the Government General Hospital, the Government Stanley Hospital, the Government Royapettah Hospital and the Government Kasturba Gandhi Hospital. A Medical Officer qualified in Tuberculosis was in charge of each clinic. Two Health Visitors were attached to each of the three clinics attached to the Government General Hospital, the Stanley Hospital and the Government Royapettah Hospital. In the Clinic at the Government Kasturba Gandhi Hospital there was one Health Visitor. The expenditure on the employment of Medical Officers and Health Visitors was borne by the Corporation while the Government met the expenditure on the employment of one Nurse and one clerk in each clinic besides the cost of medicines etc., House Surgeons in the hospitals assisted the normal staff in the Clinics in the discharge of their duties. There were 18 beds in each of the clinics in the General and Royapettah Hospitals for the reception and care of emergent cases. All the clinics were provided with facilities for routine diagnosis of chest ailments and for special treatment like A. P. and P. P. etc., Cases from these clinics needing hospitalisation were referred to the sanatorium in Tambaram for admission.

The four clinics located in the State hospitals are under the supervision of the Director Government Tuberculosis Institute at Egmore in regard to their day to day administration. The T. B. Institute at Egmore is maintained by the State Government.

The out turn of work in the four clinics attached to the state Hospitals is given below:—

*T. B. Clinic at the Government General Hospital*:—During the year 1954, 6,215 patients attended the Clinic, out of which 3,952 were P. T. cases. The number of patients attended for A. P. were 72, There were 32 A. P. initials and 222 A. P. refills during the year 1954. 81 initial and 3352 refill P. P. were also given. The number of patients who attended for P. P. were 804.

2,198 contacts were examined out of which 130 cases were P. T. 32 cases were given B. C. G. In 1953, 1,566 contacts were examined out of which 114 cases were P. T. 80 cases were given B. C. G.

Financial assistance were rendered to nearly 60 patients of the Clinic by the City Tuberculosis Association at the rate of Rs. 20 per head per mensem for a period of 6 months.

*T. B. Clinic at the Government Stanley Hospital*:—During the year 1954, 5,942 patients attended the clinic out of which 1,041 were P. T. cases. In 1953, 5,665 patients were examined out of which 856 were Pulmonary Tuberculosis cases. So there was an increase of 277 new cases and 185 Pulmonary Tuberculosis cases.

There were 25 initial and 154 refills A. P. during this year. The number of patients who attended for A. P. refills were 57. 48 initial and 1,319 refills P. P. were given. The number of patients attended for P. P. refills were 535.

2,112 contacts were examined out of which 1,300 cases were Pulmonary Tuberculosis. Tuberculine testing and screening were done for all the contacts and the negative reactors were given B. C. G.

Nearly 60 cases of the Clinic were given financial assistance by the Tuberculosis Association at the rate of Rs. 20 per head per mensem.



*T. B. Clinic at Government Royapettah Hospital:—*During the year the clinic attended to 3,884 patients out of which 1,070 were Pulmonary Tuberculosis cases. In 1953, 3,339 patients attended the clinic out of which 992 were Pulmonary Tuberculosis cases. There was an increase of 545 new cases and 78 Pulmonary Tuberculosis cases.

There were 10 initial and 240 refills A. P. during this year. The No. of patients attended for A. P. refills were 84. 17 initial and 811 refills P. P. were also given. The number of patients attended for P. P. refills was 331.

588 contacts were examined out of which 22 were Pulmonary Tuberculosis cases.

3 patients were given financial assistance by the Tuberculosis Association at the rate of Rs. 20 per head per mensem.

A new building has been constructed in the Hospital premises for the Clinic with facilities for screening and collapse theaphy.

*T. B. Clinic at the Government Kasturba Gandhi Hospital:—*During the year 1954, 3,669 patients including contacts attended the clinic. 525 cases were Pulmonary Tuberculosis out of which 131 were put on the waiting list for admission into the Tambaram Sanatorium. In 1953 the total number of new patients (including contacts) were 3174. 447 were Pulmonary Tuberculosis and 85 were put on the waiting list. So there was an increase of 495 new cases 78 Pulmonary Tuberculosis cases and an increase of 46 on the waiting list.

There were 4 initial and 18 refills during the year. The number of patients who attended for A. P. was 8, but only 2 patients continued A. P. 1 patient got admission into the Tambaram Sanatorium. In one case the lesion was arrested and A. P. was stopped. A. P. had to be stopped to 4 patients for various reasons. 9 initial and 237 refills P. P. were given. The number of patients who attended for P. P. was 32 but only 9 are still continuing 11 patients stayed away on their own accord and went away to their native villages. 7 patients got admission into the Tambaram Sanatorium. P. P. was stopped for 5 patients, one due to pregnancy and 4 due to jaundice.

During 1954, 1,035 contacts were examined out of which 74 were Pulmonary Tberculosis. 69 cases were given B. C. G. In 1953, 1315 contacts were examined out of which 66 cases were P. T. 58 cases were given B. C. G.

3 persons who were thrown out of employment due to Tuberculosis received financial assistance from the Tuberculosis Association at the rate of Rs. 20 per head per mensem for 6 months.

Women suffering from Pulmonary Tuberculosis were advised to go to Family Planning Centre.

## HOSPITALS

*Infectious Diseases Hospital, Thiruvottiur High Road, Tondiarpet.*

(Telephone No. 3117)

The institution continued to serve the needs of the City as also the surrounding areas in isolating and treating cases of infectious diseases. The year under review had no epidemic. A few cases of Anthrax were admitted from outside the City limits for isolation and treatment.

In view of the unprecedented increase in the City's population and the absence of a similar hospital in the adjoining district of Chingleput, there is a great need for suitable increase in the accommodation and a corres-



ponding increase in the permanent staff to cope up with the admission during times of epidemics which are cyclic in nature.

There were 239 cases at the commencement of the year under report. 7,347 cases from the City and 582 from the mofussil were admitted and treated during the year. 7,412 cases were discharged. There were 575 deaths, 181 cases remained in hospital at the end of the year.

*Cholera* :—There were 12 cases in the beginning of the year 38 cases from the City and 43 cases from the mofussil were admitted in the hospital during the year. 7 cases died and 86 were discharged during the year. The rate of mortality was 7.5%.

*Small Pox* :—There were 106 cases at the beginning of the year. 1,181 cases from the City and 103 cases from the mofussil were admitted during the year. 239 cases died and 1027 cases were discharged. The mortality rate was 22%.

*General*.—Besides the annual repairs, some improvements were effected. The R. M. O. Quarters was remodelled. The old disused mortuary was remodelled for use as a store room.

Details of cases treated will be found in Appendix I.

#### *The Corporation Sri Tiruvotteeswarar Tuberculosis Hospital :*

*Brief History* :—Sri Thiruvotteeswarar Tuberculosis Hospital, Konnur High Road, Otteri, and its out-patient Department, the Tuberculosis Clinic, in Pulianthope High Road, are the two main institutions maintained by the Corporation of Madras for the treatment of Pulmonary Tuberculosis and are intended to serve primarily the citizens of Madras. This is the seventh year of the working of the Hospital and it continued to progress in all directions. The original staff of a Medical Superintendent, and an Assistant Medical Officer (both specialised in Tuberculosis) continued to be in charge of the Hospital with a nursing staff of one Ward Sister and 7 Nurses.

The Hospital had 64 beds (62 for in-patients and 2 for emergency cases) during the year. The Hospital is well equipped with a Laboratory, Operation Theatre, X-Ray plant and other clinical appurtenances to treat the patients in Modern accepted methods of treatment. The Hospitalisation, diet, and X-Rays are free of charge for indigent patients in the General Wards but those with an income of over Rs 100 and the Special Ward patients have to pay for their stoppages and diet as the case may be. Stoppage charges are levied in the special wards as follows :—(1) 'A' Class Special Wards Rs. 5 per diem with diet and Rs 3 per diem without diet. (2) 'B' Class Special Wards Rs. 3 per diem with diet and Re. 1 per diem without diet. Such of those patients in the General Wards having a monthly income of Over Rs. 100 but not exceeding Rs. 150 have to pay stoppages at As 12 per diem per patient as per the rates fixed by the Corporation Council. The total income derived from stoppages and diet charges collected from the paying patients during the year 1954 is Rs. 9,116. Collection from Special Ward patients Rs. 8,801 and from General Ward paying patients Rs. 315.

There is a proposal to increase the bed strength from 64 to 78. The construction of new block is nearing its completion and it is expected that it will be ready for opening within two or three months. By the opening of new block, there will be accommodation for 78 patients of which 54 in General Ward (30 Males and 24 Females), 2 emergency, 22 in special Wards both men and women (6 in (A) Class Special Wards and 16 in (B) Class Special Wards) Installation of electric lift will be also completed before the opening of new blocks.



Number of Government Servants and their dependants admitted during the year 1954 is furnished below :—

(a) Central Government Servants and dependants.	...	3
(b) Provincial Government Servants and dependants	...	2
(c) Corporation Servants and dependants.	...	25

During the year 5 patients were admitted as Emergency cases with symptoms of Haemoptysis and Spontaneous Pneumothorax.

38 patients were admitted purely on public health grounds for isolation.

Table showing the No. of Positive Tuberculous cases diagnosed at the Clinic and the No. of cases admitted for treatment at the Hospital during the last 7 years and the result of treatment.

Year.	No. Diagnosed as Tuberculous at Clinic.	Number admitted at T. T. Hospital.	No. Discharged.	Results of treatment in improved cases.
1948	1,189	86	38	12
1949	1,640	140	137	67
1950	1,630	160	152	107
1951	1,396	143	144	104
1952	1,680	164	161	98
1953	1,562	151	158	114
1954	1,260	151	155	121

### PUBLIC HEALTH LABORATORY

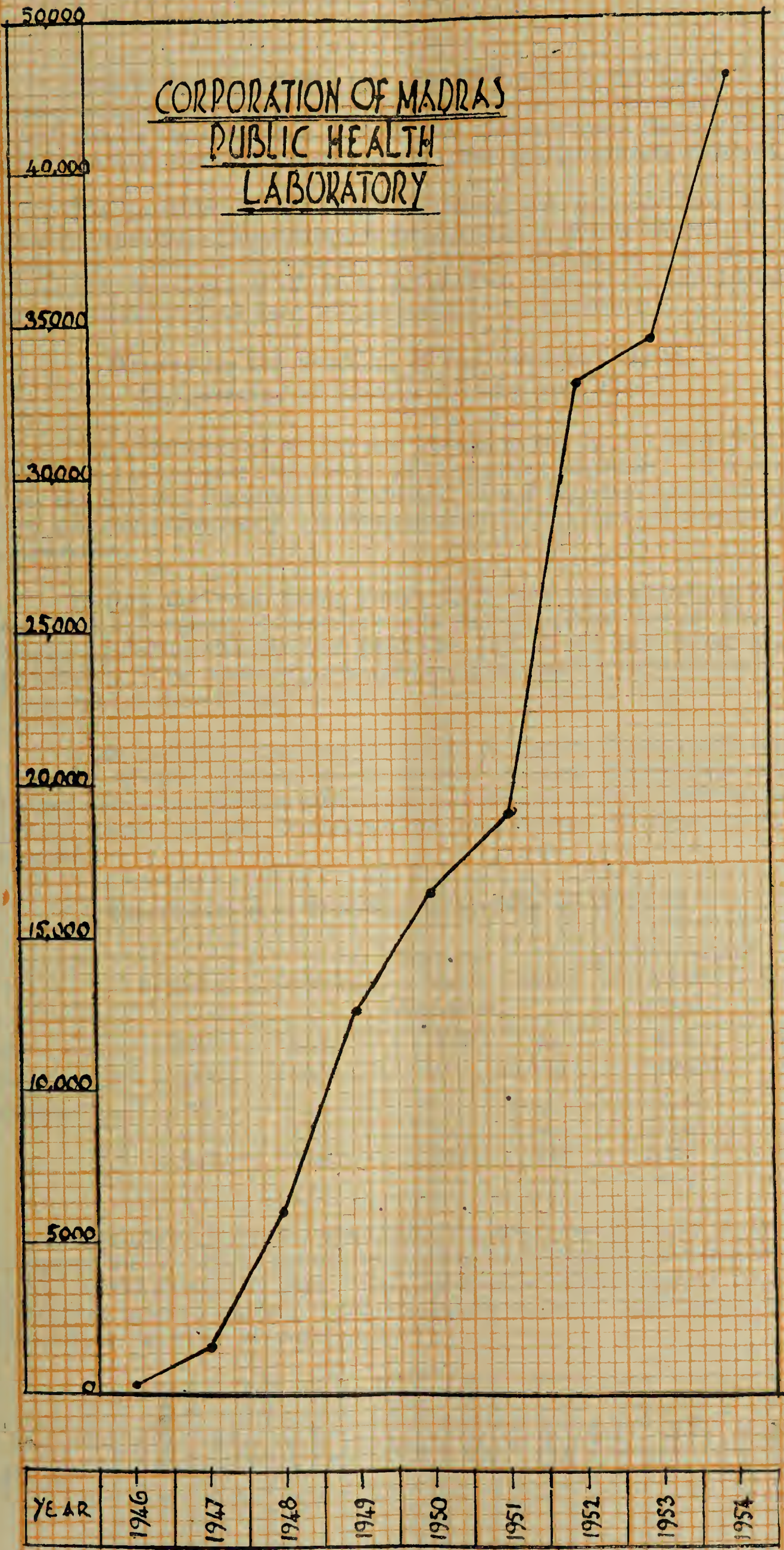
From the year of its inception in 1946 the Public Health Laboratory has been rendering useful service on an increasing scale to the citizens of Madras. The statement below indicates the progress of work year after year.

Year.	No. of samples examined.	Receipts. Rs. A. P.
1946	311	215 0 0
1947	1,492	647 8 0
1948	5,642	1,635 0 0
1949	12,266	4,766 0 0
1950	16,396	10,939 0 0
1951	19,005	11,234 0 0
1952	33,089	16,560 14 0
1953	34,315	18,649 12 0
1954	43,070	22,336 8 0

Of the total samples received, 23,119 of were from the private medical practitioners in the city and the rest from Corporation Institutions.



CORPORATION OF MADRAS  
PUBLIC HEALTH  
LABORATORY









During the year 1951, the UNICEF (W. H. O.) donated to the laboratory a field survey unit for the Venereal disease control programme and free penicillin for the treatment of anti-natal cases amongst Nursing Mothers and children with venereal disease. A complete equipment was received.

The modified V. D. R. L. screening test is done now for the diagnosis of syphilis. Quantitation is done for the positive cases. A large quantity (317 vials) of Penicillin was supplied during the year 1954, were used for the treatment of V. D. R. L. positive cases of the Child Welfare Centres. Details of work done will be found in the Appendix I.

### Report on the working of the Venereal Clinic, Corporation of Madras for the year 1954.

The Clinic opened in 1924 and situated in No. 82 and 83 A Strahans Road, catered to the poor class people in the surrounding areas. 2 Sections, one for the male and the other for the female had 2 separate accommodation and a common dispensary. A Woman medical officer was in charge of the female section.

During the year under report 3,278 new cases consisting of 1963 males and 1,310 women and children were treated. Total No. of New and Old cases treated for the year were 14,878 i.e., 8,656 men and 10,722 Women and Children. The average attendance being 40.76% i.e., Males 23.71% and Women and Children 17.05%.

3,908 injections were done and 1,351 specimens of blood were sent to the Public Health Laboratory for serological test. 470 specimens were examined under dark ground microscope and smears of white discharge were examined under ordinary microscope for gonorrhoea. 15 minor operations were done.

### Classification of Diseases According to W. H. O.

	Syphilis.	Gonorrhoea.	Soft sore or Chancroid.	Bubo	Genital lesions non venereal origin.	Total.
Men ...	220	442	717	96	493	1968
Women ...	268	280	...	5	440	993
Children ...	55	58	...	...	204	317
	---	---	---	---	---	---
	543	780	717	101	1,137	3278
	---	---	---	---	---	---

*Syphilis*:—Treatment of syphilis was done on the basis of W.H.O. recommendations. Each patient gets daily one injection of 6 lacs units of P.A.M. for 8 consecutive days. For Children the dosage had to be varied according to age and weight. Frequent defaulters had a bulfi dose of 24 lacs units of P. A. M. given at one stretch.

No. of	No. of patients who have taken 8 injections.	No. of patients who have taken 7 injections.	No. of patients who have taken 6 injections.	No. of patients who have taken 5 injections.	No. of patients who have taken 4 injections.	No. of patients who have taken 3 injections.	No. of patients who have taken 2 injections.	No. of patients who have taken 1 injection.	No. of patients who have taken no injection,	No. of patients who were treated in 53 and not in 54.
Men ...	49	13	19	13	26	11	9	23	73	—
Women.	182	16	10	14	20	10	8	2	23	13
Children.	20	—	—	2	—	—	—	2	2	—



253 Couples were serologically examined. Out of these 65 Couples were + ve., 9 couples & children were + ve.. 5 mothers & children alone were examined. 3 Husbands with 2 wives were + ve. 19 Husbands were treated at this clinic while their wives were treated at the C.W.S.

73 men, 23, women & 2 children did not attend the clinic after their serological test and they could not be traced.

#### Follow-up work

	No. available for serological test after treatment	No. showed negative result (cured)	No. of weak positives	No. of positives	No. of positives 1 in 2 dilutions	No. of positives 1 in 4 dilutions	1 in 16 positive	1 in 32 positive	1 in 128 positive	All three tests positives	2 tests positive
Men	28	14	6	-	1	1	-	-	-	6	-
Women & Children }	56	16	11	1	3	6	2	1	1	6	9

*Gonorrhoea*—442 men, 280 women and 58 children were treated for gonorrhoea with pencillin. 717 men had Chancroid and 96 men and 5 women had bubo and were given suitable treatment. 493 men, 440 women and 204 children had genital lesion of non-venereal origin and were given suitable treatment.

*Health Visitor* visited 705 houses during the year and contacted 448 cases. 120 of them responded to the call.

As the Medical Officers of Child Welfare Centres also treated expectant mothers attending the centres, only 29 cases were referred to this clinic during the year.

### ASHOK VIHAR

#### Health and Recreation Centre

No. of families on Rolls on 1st January 1954	...	302
No. of families enrolled during the year	...	101
No. of families removed during the year	...	88
No. of families on 31-12-55	...	315

The centre has served member families for varying periods ranging from 1 to 6 years from its inception in 1948.

188 visits were made by the two medical officers and the two welfare organizers to the homes of the member families. These visits enabled the members to learn about health education and the workers had an opportunity to study the socio-economic standard of the members. Health education consisted of personal, domestic and environmental hygiene, nutrition, care of infants, education of children, family planning, value of preventive inoculations and periodic health check-ups. Infants were followed-up more or less weekly and sick members were assisted in getting the necessary facilities at the State Hospitals. Families were given suitable advice on various problems confronting them in their day to day life.

Weekly visits were made to the slums outside the Centre's area, particularly those in the outskirts of the city, with the object of educating the residents on matters pertaining to promotion of health, advising medicines to the sick and admitting serious patients in the State hospitals.



Members of the Centre, young and old of both sexes, took to social service in these slums. They attended to the personal hygiene of children, domestic hygiene of families, sweeping and cleansing the lanes and surroundings of dwellings.

At Senyar Palayam in Aminjikarai a delapidated shallow well which was a source of mosquito breeding was filled up with earth. At Olcott Kuppam in Adyar, factions among three local leaders were amicably settled and a road belonging to the Theosophical Society which was prohibited from being used by the people was thrown open after negotiations with the Society authorities. The members who took part in these activities were enthusiastic as they were rendering service to their own kind living in other slums.

*Service at the Centre* :—Each individual in the family was given a health check-up to assess the standard of his or her health, to advise and suitably correct any malady at its initial stage.

1095 general, 649 dental, 679 eye, and 549 E.N.T. check-ups were done. 501 pathological investigations and 35 screenings of the chest were made. 231 members were referred to the State hospitals either for admission or treatment. 461 members were mass X-rayed by the mobile Mass X-ray plant of the Government T. B. Institute, Egmore. 26 members were advised to undergo further investigation. 7 members had T. B. of the lungs and the rest were negative. During the routine check up 168 cases of deficiency diseases, 62 of nutritional anaemia, 7 of T. B. 7 of Kala-azar 4 of Eosmophilia 2 of Diabetes, 52 of Tonsils and Adenoids, 6 of High blood pressure, 4 of Syphilis, 4 of Leprosy, 3 of chronic Gonorrhoea, 58 of refractive error, 45 of Pyorrhoea Alveolaris and 14 of dental caries were diagnosed and appropriate advise and treatment were given to them.

With the advise given 58 cases of deficiency diseases, 11 of nutritional anaemia 4 of Kalazaar, 4 of T. B., 4 of Syphilis, 3 of chronic Gonorrhoea, 2 of Diabetis, 4 of Eosmophilig and 2 of Leprosy were cured. Two members underwent tonsilectomy; two members appendicectomy, and one member an operation for Procidencia and 7 members had their error of refraction corrected.

*Dispensary.* 13,098 prescriptions were dispensed to the members.

*Maternity Section* :—

No. of women examined antenatally during the previous year but not delivered on 1-1-54.	...	15
No. of ante-natal cases examined	...	115
No. of deliveries conducted with ante-natal exam.	...	72
No. of deliveries conducted without ante-natal exam.	...	5
No. of women members delivered in the Women and Children Hospital.	..	9
No. of women members delivered in the Corporation Maternity and Child Welfare Centres.	...	4
No. of women members delivered in other hospitals.	...	2
No. of women members delivered at home	...	15
No. of women members who had abortion.	...	2
No. of women members not traceable due to change of address.	...	1
No. of women members not delivered on 31-12-54.	...	25



Nutritional anaemia and Vitamin "B" deficiency diseases were more predominant in the anti-natal examinations. Toxaemias of pregnancy were significantly low. 40 expectant mothers were tested for blood Kahn and 5 were found to be positive and were treated.

Among the 107 women members who delivered either in institutions or at home 2 were premature deliveries, 1 still birth, 1 triple, 1 twin (both triplets and twins, were born in Ashok Vihar) 1 Breech presentation 1 post partum haemorrhage and 2 forceps delivery. (Women and Children Hospital).

During the latter part of the year vaccination of expectant mothers was undertaken as a research programme. 22 mothers were vaccinated. 3 babies born to these mothers did not develop reaction when they were given primary vaccination.

*Family Planning Clinic*:—Family planning advice was given to men by the Director and to women by the Asst. Director.

Total No. visited	...	15
Advice on Rhythm method	...	1
„ Mechanical aid	...	2
„ preceptive	...	2
Mechanical aid given	...	10

Of the 10 who were given diaphragm and Ortho jelly, 1 got pregnant for not using the aid regularly.

*Creche*:—

No. of children on rolls on 1-1-54	...	75
No. of children admitted during the year	...	45
No. of children removed	...	45
No. of children on rolls on 31-1-54	...	75

22 children of the school going age were admitted in various schools; 6 children left due to change of residence; 13 children stopped without any reason and 4 died due to complication of measles.

659, general, 101 E. N. T. 44 eye and 39 dental check-ups were done.

The following diseases were noted:—

Vitamin A & D deficiency.	24	T. B. lungs.	1
Vitamin B deficiency.	5	Malaria.	1
Anaemia.	13	Typhoid.	1
Measles.	31	Scabies.	11
Chicken pox.	5	Impetigo.	11
Amoebic Dysentery.	5	Rheumatic heart disease.	3
Bacillary dysentery.	11	Broncho Pneumonia.	3
Whooping cough.	1	Conjunctivities.	34
Head lice.	7	Hydrocele of cord	1



*Lab. Investigations :—*

Blood count total.	96	Low H/B percentage.	32
High W.B.C. count.	76	High lymphocy count.	41
Low W.B.C. count.	50	Moderate Eosinophil count.	38
Blood smear-total.	4	High Eosinophil count.	26
Negative for malarial parasites.	3		
Positive.	1		

*Motion :—*Total 101.

Round worm ova.	48 (Total Examined 77)	Ent. Histolylica.	5
Giardia Lamblia.	13	Ankylostom ova.	2
Whip worm ova.	15	Bacillary dysentery.	11
Motion culture for B. Typhores.	1-Negative.		

*Urine :—*Total 67.

Albumin	+2
RBC & Puscells	+1
Bile salts & Pigments	+1

*Preventive Inoculations :—*

Primary vaccination	...	6
Secondary vaccination	...	67
T. A. B. Inoculation	...	20
Whooping cough vaccine	...	20
Manteaux test done	...	41
Positive reaction	...	7
Negative reaction	...	34
B. C. G. Inoculation	...	33 (One child was absent.)

This section was in great demand and quite a number of children had to be put in the waiting list. Nursery education by the trained teacher was of immense benefit to the children and they were not averse to school going when they were admitted on attainment of the school going age. Mothers meetings were held periodically at the Centre when they were educated on the proper upbringing of children.

*Youths' Section :—* Recreation sections have been provided separately for boys and girls at the Centre so that they could joyfully spend their after school hours.

*Girls' Section :—* Average attendance 30 on week days.  
 " " 50 on holidays.

This section was without the Welfare Organiser for 4 months during the early part of the year with the result, the average daily attendance fell a bit.

The activities consisted of attention to personal hygiene in the form of inculcating habits of daily bath, mending of garments, card-board work and



paper-flower cutting. Talks on cleanliness, nutrition, regularity to school, ethics and morals were frequently given. Books from the library were issued to girls with a view to get into reading habits. Songs, dances, and Histrionics were taught. Recreational facilities, both indoor and outdoor, were provided. Total strength was 115 girls of which 165 were studying and 30 were not studying.

*Boys' Section* :—Average attendance, 35 on week days.

” ” 50 on holidays.

The activities were similar to that of the girls' section excluding mending, stitching and dancing.

The attendance of both boys and girls has been lower than the previous year. This is due to the fact that a number of night schools have sprung up in the slums and they visit every evening at 6 P.M. It would be interesting to note that these children in addition to this night school, also have morning classes from 6 to 8 A.M. and the regular school from 10 A.M. to 5-30 P.M. These night schools are run by the local leaders who refuse to realise the importance of recreational activities inspite of our frequent advice.

*Women's Section* :—Average attendance 25 on week days.

” ” 40 on holidays.

Medicine and skimmed milk which were distributed in the evenings were the main attractions for these women to come to the Centre.

A few of them got interested in sewing and stitching and some others were interested in indoor games.

Frequent talks were given to them on personal domestic, environmental hygiene, nutrition, care of children, expectant mother-hood, family planning and the proper use of leisure.

Over 150 garments from various sections are mended.

*Men's Section* :—Average attendance 40 on week days.

” ” 60 on holidays.

Men has not only took part in weekly slum activities but attended the centre in the evenings for recreational purposes. The dramatic club which they formed produced 3 dramas during the last anniversary and they have organised an orchestra among themselves. During the year the men managed the Binding section without the Binding Instructor. Excursions were arranged periodically and they themselves made all the arrangements for the excursions.

Improvement was noticed in their standard in the indoor and outdoor games they had been playing.

### Particulars of Matches Played.

	No. of matches played.	Result.	
		Won	Lost.
Volley Ball	7	4	3
Foot-ball	9	6	3
Badminton	4	3	1
Table Tennis	9	7	2
Carroms	7	5	2



**Canteen:**—Snacks and tea were sold to the members at cost price and the total turn over during the year amounted to more than Rs. 1,500. Training and studying opportunities were provided for students of medicine, nursing and social work.

Students from the following Institutions visited.

1. Madras Medical College.
2. Stanley Medical College.
3. Christian College, Vellore.
4. College of Indigenous Medicine.
5. College of Nursing, Vellore.
6. College of Nursing, Delhi.
7. Orientation Training Centre, Poonamallee.
8. Co-operative Training Institute.
9. School of Social Work.
10. Teachers' College, Saidapet.
11. Lady Willingdon Training College.
12. Stella Maries College.
13. Montessori Trainees.
14. Red Cross Trainees.

Training in the creche was given to one ancillary staff from the Magnesite Works Salem and three of our members voluntarily underwent training. 3 Students from the School of Social Work were given training in the recreation sections.

The Venereal Department of the General Hospital was given assistance in their research work on blood of expectant mothers. The Director of Rural Welfare was furnished with all details regarding equipment, personal etc, for starting a creche.

**General:**—All festive occasions were suitably celebrated. All the members took part in the celebrations. The III Mayors' Cup Football Tournament for the slum boys came to a successful conclusion when Veeramuthu Memorial Football Club, Kondithope, won the trophy and King Birds Club, Moolakothalam, were the runners up. The Worshipful Mayor, Sri. R. Munuswamy Pillai, presided over the function and distributed the trophies. Annual sports were conducted in November, 1954, and members of all ages of either sex took part. Prizes were distributed by Mrs. Sri Ram of the Theosophical Society during the 6th anniversary celebrations.

The members arranged excursions to Kovalong, Adyar, Redhills, and Vadapalani. 48 Film shows were arranged and 131 films were screened to the members. 8 members got married. There were 21 deaths during the year among our members. Their age at the time of their death is given below :—

Under 1 month.	5	Between 6 and 12 years.	1
Under 1 year.	1	Between 13 and 18 years.	1
Between 1 and 5 years.	11	Adults.	2



Under the auspicious of the Guild of Service, 50 children were given a treat on the Republic Day at the Mohite Play Ground. His Excellency the Governor of Madras invited 10 children for a Divali Party at Raj Bhavan.

The following grants, gifts and donations were received from the following :—

1. State Government grant – Under G. O. Ms. No 985 Health dated 18-3-50. The State Government were pleased to sanction an annual grant of Rs. 6,000.

2. Out of interest accrued from the donation of Rs. 1,000 made by Sowbaghyavathi Neelambal, Sister Sowrakohana Ksheera Dharma Endowment, Milk was supplied to creche children.

3. From the Secretary South India Relief Committee for 10 bags of wheat.

4. From the Guild of Service.

(a) 3 barrels of skimmed milk powder.

(b) 4 care parcels.

(c) Christmas gift of Rs. 25 from the Thrift Shop.

(d) 2 parcels of multipurpose food.

(e) Three bags of rice.

The above donations were used for the benefit of deserving members. Thanks are also due to the British Information Service, British Council, and the U. S. I. S. and Messrs. Burmah Shell & Co., Ltd., for the loan of films and periodicals.

The World Health Organization, Regional Office, Delhi, kindly sent us pamphlets and literature pertaining to promotion of health.

*Visitors :—*The following among others visited the institution :—

1. Hony. Minister of Industries, housing and social services, Ceylon.

2. Dr. Tavisri Isarankura, Maternity and Child Welfare Project Chingmai, Thailand.

3. T. H. Butterworth Health Education, W. H. O. Geneva.

4. Worshipful Mayor of Colombo.

5. Hony. Minister for Relief and Social Welfare, Burma.

6. U. N. Welfare consultant to Government of Burma.

#### MEDICAL INSPECTION OF CORPORATION SCHOOLS

*Staff :—*There were no additions to the medical inspection staff. Four Medical Inspectors and three Medical Inspectresses continued to attend to the work during the year with great strain. The need for additional staff was keenly felt and a proposal to appoint honorary staff for medical inspection was under consideration.



*Routine of work* :—The revised plan of examining children in three stages of the school year was continued during the year under report. In spite of examining children in three classes only, all the schools could not be visited during the year. Out of 270 schools (including 59 slum schools) 107 have been visited by the Medical Inspectors and medical inspection conducted and treatment given to defective children.

The total number on roll in all the schools was 52,923 boys and 26,629 girls. There were 18,950 boys and 15,473 girls in the schools visited. The average attendance in the schools visited was 17,243 boys and 13,374 girls. 12,427 boys and 12,498 girls were examined during the year. Out of them, 6,046 boys and 7,164 girls were entrants. 5,403 boys and 4,738 girls were defective and needed treatment.

*Personal hygiene* :—1,107 boys (8.91%) and 201 girls (1.61%) were dirty in their person and clothing. Instructions on personal hygiene were imparted to them. Personal hygiene was also taught in the classes on the advice of Medical Inspectors.

*Malnutrition* :—1,602 boys (12.09%) and 1,632 girls (13.09%) were under-nourished as against 13.55% and 14.66% respectively in the previous year. Shark Liver Oil and Calcium Lactate were given to them. To a selected few, reconstituted milk was given for a period of six months. Improvement was noticed in them as a result of these steps. 1,728 boys (13.91%) and 1,013 girls (8.11%) had dental and oral complaints. 2,169 children had stomatitis and were treated at the schools with benefit. 144 had their carious teeth extracted. 58 had their tonsils removed by operation for gross infection at the hospitals. 1,785 others who had enlargement of tonsils of minor degrees received appropriate treatment. 11 having defects of vision were corrected by glasses. Others having visual defects of minor degrees received a course of vitamins with benefit. 168 children received treatment for discharging ears. 15 were defective in hearing and they were provided seats near the teacher within their range of hearing. 4,254 children received vitamin oil. 456 badly ill-nourished children in 19 schools were given vitamin tablets daily on school working days for a period of seven months from October 1954 to April 1955. In addition to the another group of 483 ill-nourished children were given reconstituted milk on all full working days from the month of August 1954 till the close of the schools. The following seven schools were selected for this :—

1. C. B. S., Seven Wells.
2. C. B. S., Sundaram Pillai Street.
3. C. B. S., Gangadareswaran Koil Street.
4. C. B. S., Venkatarangam Pillai Street.
5. C. G. S., Nattu Pilliar Koil Street.
6. C. G. S., Thana Street.
7. C. G. S., Bazaar Road, Mylapore.

As a result of this measure, children greatly improved in health. 2,343 children having stomatitis of nutritional origin and other signs of vitamin 'B' deficiency were given Yeast tablets.

*Circulatory and respiratory diseases* :—33 boys (0.27%) and 196 girls (1.57%) had defects relating to heart and blood. 173 anaemic children improved with treatment. Eight had enlarged spleen due to Malaria and they were suitably treated.

*Diseases of bones and joints* :—460 had deformities of chest due to rickets in childhood. 15 showed the effects of attack of infantile paralysis in



their childhood or were suffering from disorders of nerves. They were suitably treated.

*Infectious and contagious diseases*:—526 boys (4.23%) and 863 girls (6.91%) had infectious and contagious diseases, the corresponding percentages for the previous year being 3.96 and 5.89 respectively. 813 children were treated for scabies. 294 children having signs and symptoms of "Hansen" infection in early stages were treated at the Corporation skin and leprosy clinics. There was good improvement in them.

*General preventive work*:—The Medical Inspection staff inoculated 1,634 children against Cholera. 35 were inoculated against Typhoid. 5,739 children were re-vaccinated in the schools.

*Other diseases and defects*:—331 children were having defects not mentioned under the above mentioned heads. They were suitably treated.

*Medical treatment*:—Children suffering from malnutrition, vitamin deficiencies and minor ailments were treated at the schools with the assistance of the teachers. Mal-nourished children were given midday meals, shark liver oil and calcuim lactate. Some selected children were given reconstituted milk. Vitamin tablets were also given to the children showing signs of extreme malnutrition. Other minor ailments received appropriate treatment.

8,199 children were treated at the schools. 1,409 were sent to the Corporation dispensaries for treatment of ailments that could not be attended to at the schools. 1,073 were sent to Government hospitals for receiving attention to some of the more serious ailments.

*Re-inspections*:—315 re-visits to schools were paid after the routine inspections for treatment and re-examination of the defectives. 12,736 re-examinations of children were done during these re-visits.

*Co-operation of parents and teachers*:—1,403 parents of children were present in the schools at the inspection and treatment of their children. Adequate arrangements were made by the school staff for the treatment of the ailing and good results were obtained.

*School sanitation*:—Sanitary defects in the school buildings, latrine, playground and water-supply were noticed and suggestions were made to remedy them.

*Midday meal*:—10,946 children in 225 schools situated in poor localities were provided with midday meals on all full working days. The Medical Inspectors supervised the arrangements made for the distribution of food. In addition to this, 120 nursery school children were given fried rice powder mixed with milk and sugar in the mornings.

*Health education*:—142 lectures and 260 talks were arranged in the schools for the benefit of the children. The total attendance of these was 13,538.

*Medical examination of Corporation workers*:—1,280 males and 232 female thozhilalis of all departments were examined for physical fitness or invalidation during the year and appropriate certificates were issued to them.

## SANITATION.

Dr. S. E. D. Masilamani continued to be the Health Officer. He was on leave from 21-12-53 to 28-2-54 and for one month from 14-7-54 when Dr. Ranganathan, the senior-most A.H.O. acted in his place as Health Officer.



The Health administration of the city was looked after by the Health Officer assisted by four Assistant Health Officers. The city was divided into 4 ranges consisting of divisions 1 to 13, 14 to 25, 26 to 40 and 41 to 50. Five of the larger divisions continued to remain bifurcated as a measure of administrative convenience each part being in charge of a sanitary inspector. There were thus 55 sanitary inspectors in charge of the work connected with the Health Administration of the 50 divisions in the city. One of the Assistant Health Officers whose services were lent to the newly created conservancy department continued to work there.

*Water-supply* :—The main source of protected water-supply continued to be the water works at Kilpauk and the infiltration gallery wells at Sembiam and Saidapet. A detailed report by the Water Analyst on the water supplied to the city will be found elsewhere in the report.

Water mains were scoured by the water works overseer as frequently as possible to avoid smell complaint in the tap water. There were 413 public fountains in the city on 31-3-54. During 1954-55 103 fountains were newly erected and 14 fountains removed. Thus there were 4,102 fountains on 31-3-55.

Protected water was supplied to the slum dwellers in the extended areas through lorries specially designed and maintained by the water works department for the purpose. A statement showing the area benefitted by supply of water so made is given below :—

Name of Area.	Place.	Volume of water supplied.	No. of trips made daily.
Saidapet ...	1. Velacheri Road ...	800 gls.	One trip.
	2. Taluk office ...	800 gls.	Do.
	3. Y.M.C.A. Village ...	800 gls.	Do.
	4. Masohanpet ...	800 gls.	Do.
Kodambakkam.	1. Nehru Street ...	400 gls.	Do.
	2. Saligramam cheri ...	800 gls.	Do.
	3. Varadarajpet ...	800 gls.	Do.
	4. Kodambakkam cheri... ..	800 gls.	Do.
	5. Paramesapuram ...	400 gls.	Do.
Sembiam ...	1. Maduma Nagar ...	1,600 gls.	Two trips.
	2. Malapattadry ...	1,600 gls.	Do.
	3. Iynavaram cheri ...	800 gls.	One trip.
	4. Gopalapuram ...	800 gls.	Do.
	5. Satabapathi Mdr. ...	800 gls.	Do.
	6. Nails garden ....	800 gls.	Do.
Total ...		12,800 gls.	of water supplied to slum dwellers in extended area daily by lorries.

*Sewers and flushout latrines* :—The total length of sewers laid in the city at the beginning of the year was over 402 miles. Further areas in the city were linked to the underground drainage system. During the year, 49,803 feet (9.43 miles) of sewers were laid in several parts of the city. A statement showing the length of sewers laid in several parts of the city is given in the appendix I.

1,454 flushout latrines were constructed during the year in private houses. The total number of sanitary installations carried out by licensed plumbers during the year and connected to the sewers is 894. The total number of sewer connections given during the year was 1346.



*Housing* :—By way of solving the problem of housing in the city, the construction of tenements particularly for poorer sectors of the population was proceeded with. A number of such tenements constructed during 1953-54 and 1954-55 are as follows :—

1953-54 :	1. Tenements at Bandar Rama Naidu gardens ...	28 Nos.
1954-55 :	1. Tenements at Koravankulam ...	6 Nos.
	2. Tenements at Angalammen Koil Street ...	4 Nos.

Besides these 10 "F" type houses in Kilpauk water works 3 "A" type buildings 2 "B" type buildings and 1 "F" type building with garrage were constructed in Shenoy Nagar during 1953-54.

Improvements and repairs to existing buildings found essential in the interest of public health were insisted upon under the provisions of section 11 of the Madras City Municipal Act. The sanitary inspectors carried out routine inspection of houses in their respective divisions for taking action to rectify defects noticed in their sanitary conditions. 26,465 houses were inspected by them during the year. The chief defects noticed were lack of proper drainage, inadequacy of proper latrine accommodations, defective water supply and insufficient ventilation. Complaints were received in respect of 984 houses and these were also looked into, particulars of defective houses with action taken are given below :—

1. No. of houses without proper drainage ...	842
2. No. of houses without adequate latrine accommodation ...	520
3. No. of houses without proper water supply ...	174
4. No. of houses with insufficient ventilation ...	387
5. No. of houses found otherwise defective ...	3,247
6. No. of notices issued for rectification of defects ...	4,680
7. No. of houses repaired as a result of action taken.	4,180

*Offensive trades* :—11,794 applications for licensable trade were received during the year. 10,867 cases were licensed during the year. 578 cases were refused licence and 349 cases were pending consideration at the end of the year.

*Cattle yard* :—1,298 applications were received and in 1,207 cases licences were sanctioned. In respect of insanitary cattle yards and unauthorised ones, 1,070 notices were issued. To deal with defaulters 860 prosecutions were launched. As a result of action taken 460 were improved before the end of the year.

The Corporation maintained four cattle-yards in the congested parts of the city to facilitate the owners of milch cattle to house their animals in a sanitary way.

Particulars of these four cattle yards are given below :—

Location.	No. of stables.	No. of animals.	Remarks.
1. Basin Bridge Road ...	132	264	—
2. Kosapet ...	40	124	Flooring laid.
3. Napier Park, Chintadripet ...	29	58	—
4. Venkatrangam Pillai Street, Triplicane ...	10	34	—



*Dobhikhanas* :—The Corporation maintained the following dobhikhanas in various parts of the city where the need for providing facilities to dhobies was felt.

Location.	No. of Stones.	Remarks.
1. Butchammal Street, New Washer-manpet	... 40	A cemented flat provided around the stones.
2. Robinson Park	... 42	—
3. Cornsmith Nagar	... 52	—
4. Macnicol Road (Chetpet)	... 136	—
5. Apparswami Koil Street	... 14	—
6. Kosapet	... 52	—

*Rabies control* :—Anti-rabic measures were carried out by seizing stray unlicensed dogs in the city and electrocutting them. There were 8 dog catchers licensed for the purpose. They accompanied two motor vans specially built and provided with wiremeshed cages for catching the stray dogs found in streets and public places and conveying them to the lethal chamber for disposal. The out turn of work in this behalf is given below :—

		Dogs.	Bitch.	Total
1. No. of dogs on 1-1-54	...	60	61	121
2. No. seized during the year	...	11,604	12,594	34,198
3. No. Electrocutted	...	8,922	11,869	91
4. No. Claimed by owners	...	1,627	725	...
5. No. of dogs given to medical colleges for experimental purposes	...	1,058	Nil	...
6. No. of dogs on 31-12-54	...	57	61	...
7. No. of rabid dogs	...	...	...	191

107 stray pigs were also seized and disposed of during the year.

*Disposal of dead* :—The Hearse van for the conveyance of the dead to places of their disposal was availed of by the public by paying the requisite fee of Rs. 5 for the transport of carcasses within the city limits.

If the coffin had to be removed out of the city an extra fee of As. 8 per mile from the outskirts of the city was charged. An income of Rs. 3,615-8-0 was realised by way of charges for the services rendered during the year 1954-55. The expenditure incurred during the same period for maintenance of the service was Rs. 4,930-9-3.

*Extracts of Births and Deaths* :—Extracts of births and deaths from the Birth and Death Certificate registers were furnished to the Public on payment of the prescribed fees. During the year 3,875 applications for extracts were received of which 3,012 extracts were issued. Extracts could not be furnished in 571 applications, the date furnished being inaccurate. The applications pending disposal at the end of the year were 292.

#### THE MADRAS ZOOLOGICAL GARDENS (1954-55)

The steadily increasing popularity of the Madras Zoo, as a source of both entertainment and education has attracted the attention of the City Council which resolved to admit school children to the Zoo at a concessional rate on one anna per head and requested the Government to increase the annual grant of Rs. 5,000 sanctioned in G. O. No. 1652 I. A. dated 3-8-53



to Rs. 10,000 to compensate the Corporation for the resultant loss of income, and the Government have been kind enough to enhance the grant accordingly to Rs 10,000 per annum with effect from the beginning of the year 1954-55 in their G. O. Ms. No. 1625 1. A. dated 19-11-54.

*Visitors* :—In the usual traditional way the Zoo attracted large number of visitors from the mofussil. Almost all the schools in the city and the suburbs visited the Zoo. Unusually this year during January the large number of people who came to the city in connection with the National Congress Sessions at Avadi visited the Zoo, and during the sessions period the Zoo was closely packed with visitors. It is estimated that during that period alone more than 60,000 people had visited the Zoo. On the whole it is estimated that about 3,96,000 adults and 79,200 children visited the Zoo during the year under report.

*Distinguished visitors* :—The Hon'ble Shri M. Bakthavathsalam, State Minister for Agriculture and Forests visited the Zoo and evinced great interest in the exhibits when he inaugurated the 'Utility Enclosure' in the Zoo. Mr. P. D. Stracey, Senior Conservator of Forests, Assam visited our Zoo under instructions from the Chief Minister of Assam to enquire about the welfare of the Rhinoceros 'Kushol' which was got as a gift from Assam. Mr. Stracey expressed very great satisfaction on seeing the good condition of the animal. Rajah Shri Yeshvant Rao Gorpade, Rajah of Sandur and regional Secretary of the Indian Board for Wild Life and some of the F.A.O. members also visited the Zoo.

*Honorary Visitors* :—The Chief Conservator of Forests, Madras State, the Principal, Veterinary College, Sri. A. A. Nair, Sri C. E. Holland and Sri P. V. Ramanujam Chetty continued to serve as honorary visitors. They made several individual visits, and the committee of honorary visitors met twice in the course of the year and considered proposals for celebrating the centenary of the institution in the year 1955.

*Centenary Committee* :—This Zoo will be 100 years old next year, and in order to celebrate the centenary in a grand manner and to carry out much needed improvements, a special committee consisting of official and non-official was formed.

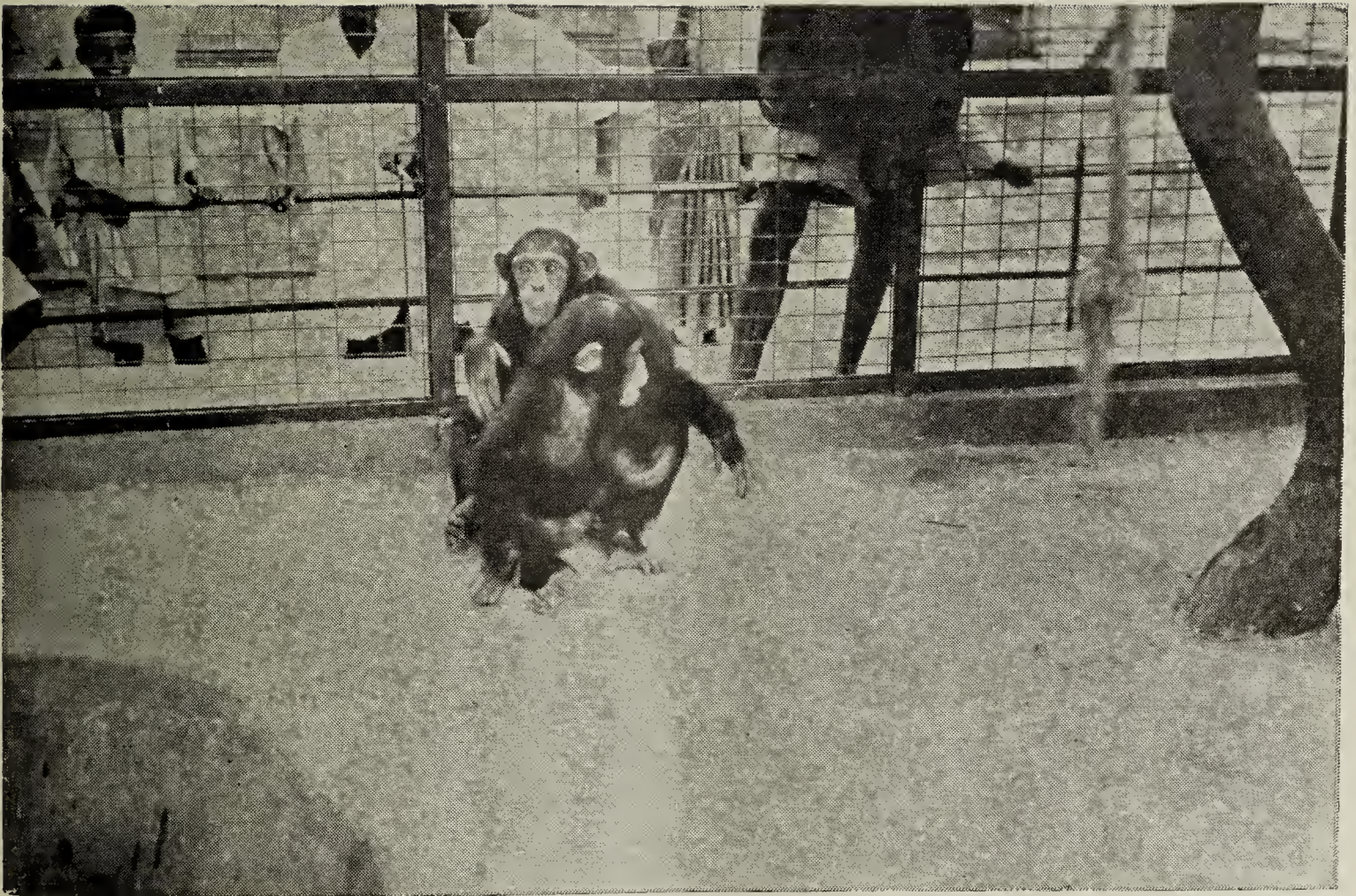
*Zoo Live-stock* :—At the commencement of the year, the Zoo live stock consisted of 679 specimens comprising of 186 mammals, 471 birds and 22 reptiles.

Acquisition through births, purchases, inward exchanges and gifts numbered 129 while reduction due to death, sale, outward exchanges, destruction, gifts etc. was 139. There was thus at the end of the year 669 individual specimens consisting of 197 mammals, 451 birds, and 21 reptiles.

The following statement will show the details of additions and disposals under each class.

Class	Additions						Disposals						No. at the end of the year
	No. at the beginning of the year	Gifts	Purchase	Births	Exchange	Total	Sale	Deaths	Exchange	Used as Food	Gifts	Total	
Mammals	186	2	3	45	...	50	12	19	2	4	2	39	197
Birds	471	...	1	77	1	79	8	28	...	63	...	99	451
Reptiles	22	...	...	...	...	...	...	1	...	...	...	1	21
Total	679	2	4	122	1	129	20	48	2	67	2	139	669





New enclosures constructed in the Zoo.







### Status of Collection

Class	Species	Specimens
Mammals	... 41	197
Aves	... 38	451
Reptiles	... 9	21
	—	—
Total	... 88	669
	—	—

*Additions by Purchase*:—One of the most outstanding purchases made this year is a pair of young chimpansees for a sum of Rs. 7,000 from a Swiss dealer. The Chimps were flown from Spa Zoo in Belgium on 31st July 1954. They were kept under great care and are now hale and healthy. They proved the biggest attraction and drew large crowds.

A donkey was purchased to replace the dead one, and the new one was trained in a very short time to pull the feed cart. The donkey cart, as usual proved a great fun for the visitors.

*By presentation*:—Two gifts were received this year. One Malabar squirrel was received from Shri P. Dhanrajulu Naidu, Deputy Superintendent, Madras City Police, and one spotted deer from Dr. S. Rao.

### By Births and Hatchings

Births		Hatches	
Albino antelopes	4	Manilla Dacks	6
Spotted deer	10	Pigeons	69
Sambar deer	1	Fowls of sorts	2
Wallaby	1		
Zebra	1		
Nilgai	2		
Rabbits	17		
Guinea Pigs	3		
Jackals	6		

*By Exchange*:—There were not many opportunities for making suitable exchanges in the course of the year. However, one sulphur breasted toucan was received in exchange for a pair of sambar deer.

*Disposals by presentations*:—On the recommendation of His Excellency the Governor of Madras a pair of Albino antelopes were presented to the Prince of Wales Zoo, Lucknow.

*By sales*:—The following surplus animals and birds were disposed of by sale: 7 rabbits, 5 Guinea pigs 2 budgerigars, 2 cockerels and 4 pigeons.

*By deaths*:—The following animals died during the year under report :

1 leopard	1 white swan	1 crocodile
1 mouse deer	1 common duck	
1 toddy cat	2 canaries	
1 donkey	3 jungle fowl	
7 Guinea pigs	3 Pea fowl	
8 Rabbits	5 Finches	
	5 Fowls of sorts	
	8 Budgerigars.	



Apart from the deaths due to natural causes 4 rabbits and 63 pigeons were used for feeding the carnivora and the constricting snakes.

Proper care and attention have been paid to the health and general hygiene of the Zoo animals, and thereby the death rate has been kept as low as 7-81 this year. All sick and new arrivals were hospitalized and necessary treatment rendered. Post mortem examination having been made of all specimens that died during the year the findings have been recorded as usual. In some cases the help of the Principal, Madras Veterinary College, was obtained for detailed pathological examination. There was no outbreak of contagious or infectious diseases of serious nature during the year under review.

*Improvements :—*A scheme for expanding the Zoo has been drawn up. An area of nearly 3 acres adjacent to the Zoo on the eastern side by the side of the Buckingham canal has been taken up and this area has been enclosed partly by masonry wall and partly by zinc sheets. The zinc sheet fencing on the eastern side of the deer enclosure has been removed and a chain-link-mesh has been run through for a length of 1072 feet so as to transfer all the ruminants to the newly extended area and improve the existing deer enclosure by raising good lawn and rest centres for the benefit of the visitors.

In August 1954 a “ *Utility Enclosure* ” was built in the Zoo opposite the leopards enclosure and the new enclosure was inaugurated by the Hon'ble Shri M. Bakthavathsalam, Minister for Agriculture and Forests. The Utility enclosure is the first of its kind to be designed by the superintendent. This enclosure is meant for display of all kinds of animals and birds and big constricting snakes which are arboreal, terrestrial and aquatic in nature. A pair of raccoons were chosen to be housed first and the Minister introduced them in to the new enclosure much to the delight of the visitors.

The Brown bears enclosure had only a small tank which was found quite inadequate for their use, and so the tank was widened and rebuilt. The bears have found better enjoyment in the wide tank and delighted the visitors by their gambol in the tank.

*A Squeeze cage :—*A new iron-barred cage on wheels of suitable design for conducting surgical operations on wild animals whenever necessary was manufactured at the Corporation Work Shop. This cage came in very handy, and was put to use for the first time to cut away the over-grown claws of a tiger which suffered from septic wounds in the front paws. The animal showed such powerful resistance that the job had to be done in different stages. The ulcerating paws recovered completely and the animal regained its usual health. The squeeze cage was put to use for a similar operation on a black panther.

*Boats :—*Seven boats which were plying in the Zoo lake were repaired by the Zoo staff in a very short time without causing much inconvenience to the contractor.

*Garden :—*The programme of planting trees in all vacant places was continued and all casualties of the previous year among the avenue trees were filled up. The eucalyptus trees planted in the previous years have survived and they have grown over 20 feet. Arrangements are being made to plant more eucalyptus trees in the course of next year in order to get the Koala bears which live only on the eucalyptus leaves. The entire garden was maintained in a better condition this year.

*Revenue :—The Gate.* The right of collecting fees for admission to the Zoo and at the cycle stands during the year under report was let on lease for a sum of Rs. 90,000, and the contractor was asked to pay a sum of Rs. 5,000 besides the lease amount for the purchase of a pair of chimpanzees which he did.



*Amenities—Boating* : Boating in the Zoo lake continued to be as popular as ever before. Seven boats were plied in the lake. The right of collecting fees for plying pleasure boats during the year under report, was let on lease for Rs. 3,600. It is estimated that about 25,000 visitors enjoyed boating in the lake.

*Canteen* :—The right of running the canteen was auctioned for a sum of Rs. 3,800 for the year under report.

*Cameras* :—234 still cameras and 9 cine cameras were admitted and a sum of Rs. 261 was realised in this behalf.

*Hire of Animals* :—The Elephants and Camels were hired out for film purposes on two occasions. These animals were also hired out for processions in the city limits on 32 occasions. A sum of Rs. 3,351 was realised as hire charges.

*Joy Rides* :—Joy rides on camels, elephants, baby elephants and the pony were conducted as usual. About 2424 adults and 3018 children enjoyed the rides. A sum of Rs. 491-10-0 was collected as fees for rides.

*Sale of Animals* :—There was not any big sale as in previous years. A sum of Rs. 142 was realised by sale of some of the small animals. This included the sale of cut pieces of the tusks of elephant Krishna. The 8 pieces of ivory were sold out locally for a sum of Rs. 90.

*Sale of Dung* :—71 cart loads of elephant dung were removed as manure, and a sum of Rs. 213 was realised.

*Sale of eggs* :—573 fowl eggs were sold away and a sum of Rs. 143-4-0 was realised.

*Sale of Zoo guides* :—Only 84 copies of the guide were sold and a sum of Rs. 84 was realised.

*Stallage charges*.—Unusually this year there was a large export of elephants from the Madras Coast. Though most of the elephants were stalled at the harbour 35 elephants were stalled in the Zoo. Out of which 3 went to America and 33 went to Andamans. A sum of Rs. 606 was realised as stallage charges.

One of the elephants bound for Andamans was detained in the Zoo as it was carrying heavily. After nearly a month's stay in the garden the elephant suddenly died. Apprehensive of the fullness of the gestation the carcass was offered to the Madras Veterinary College for dissection. As the dead elephant could not be removed easily from the Zoo to the college, it was dismembered into 8 pieces and removed.

The Principal and the professor of anatomy conducted the autopsy and carefully dissected the animal in the presence of a large gathering of veterinary students, and secured a full grown foetus which has been carefully preserved in the college.

*The Corporation Band* :—The Corporation band was played 14 times in the Zoo for the year under report.

*Educational Activities* :—The Assistant Superintendent gave 16 broadcast talks over the A.I.R. Madras in the schools programme on subjects pertaining to animal life, and also addressed the Zoological association of the Presidency College and the Vivekananda College.

On the whole the year under report has been a successful year. Preliminary levelling and laying out of grounds for the extension of the Zoo in the additional land acquired for purposes has started, and arrangements were made to get a trio of ostriches and other African animals before the Centenary.



## HEALTH EDUCATION

Education of the citizens on matters of Public Health was conducted throughout the year by two medical officers who were entrusted with this additional work and by the divisional sanitary staff. The city was divided into two areas for this purpose and one of the Medical officers was in charge of the north range and the other in charge of the south range. Lectures and informal talks sometimes accompanied by Magic lantern demonstrations were given in accordance with the planned programme. Leaflets were printed in the regional languages and distributed to the citizens.

The outturn of work connected with the Health Education during the year is given below :—

The film on “fight against epidemics” was shown particularly in the slum areas in the city with the help of mobile projections unit kindly loaned by U.S.I.S. The proposal for a mobile projection unit for screening films on public health is still under consideration.

### All-India Khadi, Swadeshi and Industrial Exhibition :—

The Swadeshi exhibition opened towards the close of the previous year was extended till 28-2-1954 and special arrangements had to be made to continue the departmental participation till the end of the exhibition.

This All-India Exhibition scheduled to take place during the latter half of December '54 was postponed by the Exhibition authorities to synchronise with the Congress session held in the month of January 1954. As usual the department participated in this exhibition, the details of which will be given in the report for 1955.

## CARE OF DESTITUTES

The Corporation has been bestowing attention to the care of destitutes in the City by maintainnig the following institutions for affording Food, clothing and shelter to the indigent beggars and destitutes in the City:

1. Special Home for the diseased and the infirm.
2. Work House for the able bodied.
3. Poor House.
4. Orphanage.

Of these four institutions, the special home and the Work House are compulsory homes for the segregation of the beggars under the provisions of the Madras City Municipal Act. The Poor House is a voluntary home particularly for the aged destitutes in the City. The Orphanage is an institution for helpless Orphan boys in the city.

Corporation also maintained about 6 Home for the Homeless with accommodation for 235 families in the various parts of the City. The State Government in G.O. No M.S. No. 352, Home Department dated 11-4-1954 sanctioned the establishment of a Care camp and a Care Home in the Melpakkam Depot buildings belonging to the Malaya emigration authorities and of a Care Home in the Ghosala in Koonur High Road, Madras.

*Poor House (1954-55) :—*The Poor House a voluntary home for disabled destitutes of both sexes had been in existence from Nov. 1927. The labour of certain partly disabled inmates was utilised for tag making, gardening and cooking.



During the year under report, there was a total strength of 139 inmates, of which 92 were males. 30 females and 45 males were arranged to be sent to Monegar Choultry on 1-7-54 for being maintained there. They were transferred with their clothing, bedding and utensils. There were 11 deaths 62 were discharged at their request and 5 inmates absconded. The total strength of the institution at the end of the year 1954-55 was 50 males and 22 females.

A detailed statement of strength of the institution 1954-55 is put up below :—

Sex of inmates	Strength on 1-4-54	Admissions 1954-55	Discharges	Deaths	Absconded	Transfer to Monegar Choultry	Strength on 31-3-55
Males	92	50	38	5	4	45	50
Females	47	36	24	6	1	30	22

*Orphanage (1954-55):*—This is an institution run for the benefit of orphans between 5 and 14 years of age irrespective of caste, creed or colour. It has a school attached to it to impart education up to 5th standard. Accommodation to the institution is limited, to 50 orphans. At the beginning of the year 1954-55, there were 52 orphans. Five orphans were admitted to the institution and seven were discharged during the year under report. With one absconding, the total strength as on 31-3-55 was 49.

A statement furnishing the strength of the institution during the year 1954-55 is put up below :—

Inmates	Strength on 1-4-54	Admission for 1954-55	Discharges	Absconded	Strength on 31-3-55
Boys	52	5	7	1	49

*Visitors :—* The following Councillors and non-officials were appointed by the Council to serve as Hony. Visitors of the orphanage with effect from 27-3-53.

1. Sri P. M. Lingesan, B.A., Councillor.
2. „ M. Pattu, Councillor.
3. „ R. T. Sundararajan.
4. „ B. A. Moorthy.

*The Work House (1954-55):*—1. *Strength* :—At the beginning of the year, the strength of the institution was 108 men and 23 women and 7 children. During the period under report 108 men and 30 women were committed to the Home (16 women and 54 men were committed to a maximum period of one year and 10 women and 58 men to a minimum period of six months) and beggars were committed with their children below 7 years of age. During the year under report, 144 men and 38 women with 23 children were discharged on completion of their terms of detention with remission earned; 1 woman and 3 men were transferred to the Special Home; there were 7 deaths and 6 escapes. At the close of the year, there were 59 men and 11 women and 8 children.



A detailed statement of the number admitted and the number discharged is given below in a tabular form :—

	Strength on 1-4-54	No. admitted	No. discharged	No. Absconded	Deaths	No. Trans- ferred to Spl. Home	Strength on 1-4-'55
Males	108	108	144	6	4	3	59
Females	23	30	38	Nil	3	1	11
Children	7	24	23	...	...	...	8

2. *Medical Relief*:—Every inmate was examined and treated for minor ailments in the Work House itself. Cases which required specialised treatment were taken to the Government Hospitals for necessary treatment. The services of the Infectious Diseases Hospital Van were requisitioned for the conveyance of such cases.

3. *Feed*:—Feasts on important Hindu festival occasions were arranged for the year under report and their cost was met from the income derived from the endowments of (1) Sri Dewan Bahadur C. V. Viswanatha Sastriar, (2) the Government Official's Party and (3) His Highness the Maharaja of Travancore.

4. *Production*:—Productivity is a resultant of the strength of the inmates at Work House. During the year under report, weaving, coir rope making, and tag manufacturing and rattan work were the avocations taught to the inmates. Statement of work turned out in the Work House is given below :—

*Textiles*:—

310 Nos. White bed sheets.  
190 Yds. of red cloth.  
1,392 pieces of dungry cloth.  
325 Nos. towels.  
270 „ towels.  
13,920 Yds. bandage.

*Coir Ropes*:—

4,478½ ins. of ¾" size coir rope.  
2,460 „ of ⅜" do.  
3,195 „ of ½" do.  
308 „ of ⅛" do.

*Tag Manufacturing*:—

77,350 Nos. of 6" tags.  
56,420 Nos. of 4" tags.

*Garden Vegetables with Estimated Cost*:—

	Rs.	A.	P.
Utilised for Work House, Poor House and Orphanage	...	362	1 3
Supply made to other institutions	...	37	2 6
Total	...	399	3 9



5. *Recreation*:—Radio programmes were relayed on holidays and on all nights between 5-30 p.m. and 9 p.m. and also at other hours on holidays. The inmates were allowed to play carrom.

*Night School*:—Adult night school was conducted for four days in a week, with a view to enable the inmates to learn the three arts of writing, reading and arithmetic in their mother tongues. The school is conducted by trained teachers from the Education Department of the Corporation.

6. *Visitors*:—The Inspector General of Prisons, the Collector of Madras, the Chief Presidency Magistrate and the Deputy Commissioner of Police, Crime Branch and the Commissioner, Corporation of Madras visited the institution. The following were the distinguished visitors to the House during the year.

1. Sri T. Rudra, Mayor of Colombo.
2. The Hon'ble Sri S. S. Ramaswami Padayachi, Minister for Local Administration, Madras.
3. Sri V. V. Sastri, Officer on Special Duty, Planning Commission, New Delhi.
4. Sri Sarala Gosh, Lecturer, G. K. Institute, Lucknow.

The following gentlemen were elected by the city Council to be Honorary Visitors to the Work House for a period of two years from 1-1-55.

Sri. G. Loganathan, Councillor.  
 Sri. T. M. Shanmugham, Councillor.  
 Mr. Gregory.  
 Srimathi Rajam Barathi, Councillor.

The Health Officer and the Assistant Health Officer inspected the institution regularly.

7. *Expenditure*:—The expenditure incurred for the year 1954-55 is Rs. 73,750.

### The Special Home (1954-55)

The year 1954-55 opened with 280 inmates in the Special Home. The total No. of admissions during the year were 300 of which 4 cases were transferred from Work House and 3 from Govt. Care Camp. There were 401 disposals of which 324 completed their detention period. 38 were discharged prematurely under Rule 324, 1 inmate escaped and 38 died. The particulars are tabulated below:—

Particulars	Males	Females	Total
Strength on 1-4-54	238	42	280
No. admitted during 1954-55	239	54	293
No. transferred from Work House	3	1	4
No. „ from Govt. Care camp	3	...	3
No. discharged after detention	270	54	324
No. „ under Rule 324	33	5	38
No. escaped	1	...	1
No. of died	33	5	38
Strength on 31-3-55	146	33	179



The age of the inmates committed to the Home were between 18 and 74 and the periods of their detention varied from 6 months to 1 year. Of the 300 inmates admitted, 46 were old cases. The districts from which the inmates stated they came from are as follows :—

Madras City	...	79	Salem Dist.	...	4
Chinglepet	...	58	Madura Dist.	...	3
S. Arcot Dist.	...	13	Tinnevely Dist.	...	1
N. Arcot Dist.	...	9	Travancore Dist.	...	2
Tanjore Dist.	...	6	Pondichery Dist.	...	1
Trichy Dist.	...	2	Wanderers	...	122

The nature of diseases and infirmities of the 300 inmates admitted during the year is furnished in the following date :—

	Leprosy	Respiratory				Nervous				Skin		Circulatory system						Total		
		Alimentary																		
		Infective	Non-Infective	T. B.	Other diseases	Peptic Ulcer	Haemiphilia	Epilepsy	Mental neurosis	Periferal Neurosis	Scabies	Other diseases	Syphilis	Filaria	Myalgia	Myocarditis	Other diseases	Malignant diseases	Special organs	Other diseases
Males	12	67	9	5	2	3	3	6	3	3	1	3	3	1	1	3	6	25	90	245
Females	1	...	..	3	..	1	1	5	1	2	1	1	..	..	..	..	3	9	27	55
Total	13	67	9	8	2	4	4	11	4	5	2	4	3	1	1	3	8	34	117	300

*Medical Treatment* :—Almost all the cases admitted into the Home were in a very bad condition being extremely emaciated on account of starvation and mal-nutrition or suffering from chronic incurable diseases. The cases of leprosy which form, the majority were treated with oil hydrocarpus and sulphones and their ulcers were dressed regularly. The rest of the cases received suitable medical attention 42 cases requiring specialised treatment were referred to the following hospitals.

Name of Hospital	No. of cases
Govt. Royapettah Hospital	20
„ General Hospital	9
„ Kasturba Hospital	6
Corporation Infectious Diseases Hospital	6
T. B. Sanatorium	1
	<hr/>
	42
	<hr/>

As a result of the nutritious food and appropriate, medical attention given, the inmates improved in their general health and appearance and put on weights upto 40 lbs.

*Disposals* :—After completion of the detention period 324 inmates were discharged. Remissions were granted for work and good conduct. Such of those discharged cases, as have a settled place to go to were followed up by the police in the city and the Revenue Authorities in mofussil. It is learnt that four persons have left off begging and taken to home work and gardening etc.

*Escape* :—One inmate escaped during the year.



*Deaths* :—Of the 38 deaths, 15 were from the residual 280, 18 from the new admissions of 300 and 5 in the hospitals where they were admitted for treatment. Thus, there were only 33 deaths out of a total of 580 cases which works out to 5%. The causes of death of the 33 cases died in the House are furnished below :—

	Males	Females	Total
Septicaemia complicating leprosy ...	8	...	8
T. P. ...	2	...	2
T. P. ...	8	1	9
Chronic Enteritis ...	2	1	3
Chronic diarrhoea ...	...	1	1
Status Asthmaticus ...	...	1	1
Nephritis ...	1	...	1
Myocarditis ...	1	...	1
Heart failure ...	1	...	1
Cancer ..	2	..	2
Senility and debility ..	3	1	4
	<hr/> 28	<hr/> 5	<hr/> 33
	<hr/>	<hr/>	<hr/>

The staff of the institution was as follows :—

Superintendent cum Medical

Officer	...	1	
Nurses	...	4	Clerk ... 1
Compounder	...	1	First Grade Warden ... 1
Second Grade Wardens	...	13	Male Ward Attendants. 4
Female Ward Attendants	...	5	Peons ... 3
Cooks	...	4	Male Thoties ... 8
Female Thoties	...	5	Dhobies ... 3
Barbers	...	2	Gardener ... 1

*Visitors* :—The Official, non-official and ex-officio visitors visited the home regularly. The following were the distinguished visitors :—

1. Members of the Colombo Municipal-Council headed by the Worshipful Mayor.
2. Students of the Alahabad Diploma Class of Local Self Government.
3. Worshipful Mayor of Bombay.
4. Chairman, Health Committee, Ahmedabad Municipal Corporation.

The visitors were very much impressed with the upkeep of the institution and the care bestowed on the inmates.



*Free Gifts* :—The Particulars of gifts given to the inmates are furnished below :—

S. No.	Name of doner.	Nature of gift	Date & Occasion
1.	Sri T. Theogoraya Chetty	...12 post cards	11-8-54.
2.	Sri S. K. Sundaram.	Rs. 7-8-0 (Interest on Rs. 500) for the purchase on Masala for preparation of vegetable briyani	15-8-54 Independence day.
3.	Dharam Chand Galada	...Two iddlies and sweets to each inmate	30-8-54.
4.	Corporation	...Rs. 50 for the preparation of mutton pulov, wheat halva etc.	29-9-54 Inauguration day.
5.	Ratnavelu Subramanian }	Rs. 32-8-0 for the preparation of vadai, payasam and appalam	20-10-54 Birth day of son.
6.	Corporation	...Rs. 80 for preparation of chakkarai pongal, vadai, thadiyodavam, mixture, appalam etc.	26-1-55 Republic day.
7.	Mahadev Chand Galada Indra Chand Galada Punam Chand Dada }	4 Iddlies with sambar to each inmate	8-3-55 Reublic day.

*Cottage Industries* :—The cottage industries, in which the inmates engaged themselves, helped them by way of occupational thereapy. The following articles were produced during the year.

1,200 yds. Bandage cloth.

950 ,, Twill.

330 ,, Towels besides the stitching of 314 shirts.

Towards the close of the year charkas were introduced and the inmates are spinning yarn on them.

*Home Garden* :—Various kinds of vegetables such as plantains, bringals, tomatoes, drumstick, gourds, radish and greens were grown in the Home. The produce for the year weighed 13,992 lbs. and replaced the contractors supply of 195 occasions.

*Expenditure* :—The expenditure incurred for 1954-55 is Rs. 1,11,729.

### Home for Homeless

There were six Home for the Homeless in the City located at the following places :—

S. No.	Div. No.	Name of place
1	10	Old Jail Street.
2	16	133, Wall Tax Road.
3	26	Behind the Zoo.
4	29	Ritchei Street.
5	43	Gajapathilala Street.



In these homes, the homeless people coming to the City were temporarily accommodated. In practice considerable difficulty was experienced in evacuating the inmates after the stipulated period of their temporary stay in these Homes.

The Home for Homeless behind the Zoo, gifted by Sri T. P. Ramaswamy Pillai, provided shelter temporarily to new arrivals from outside the City for a period of stay not exceeding two months. It was found extremely difficult to make the 'Homeless' staying in the 'Home' to quit it after a period of two months and the same set of people often managed to come back with different names. The last set of homeless were evicted on 14-8-1954 and it was proposed that people, coming from outside the City, may be allowed to stay for a definite period of a fortnight only and to levy a punitive fee of four annas per room per day for their stay beyond this stipulated period of a fortnight from the date of their admission, with a view to discourage the tendency to stay for long periods thereby precluding other needy arrivals from being sheltered in the 'Home' for a short time till they secure permanent accommodation. Pending decision of the Council, the premises was kept vacant to effect necessary repairs.

The Council, at its meeting held on 12-5-55 accorded sanction for (1) allowing poor persons coming to the City to stay in the Home for Homeless in Peoples Park free of rent for a period of 14 days only, (2) Collecting a fee of four annas per day per room from those who over stay the gratis period of 14 days.

#### ANTI-MALARIAL OPERATION

There was a separate section for carrying out anti-malarial operations in the City under the charge of a Medical Officer with Public Health qualifications in the grade of a Second-Class Health officer. He was assisted by 5 trained Supervisors. The Supervisors were trained in anti malarial operations in the Central Malaria Laboratory. The operational personnel consisted of 8 Stegomyia Overseers, 50 Malaria Maistries and 313 Coolies. The complement of labour was divided into squads and gangs and distributed for work according to the requirements of mosquito control work in each division.

The main function of the entire malarial operation was the control and the eradication of the malaria carrying mosquitoes. The carriers prevalent in the City being *A. Stephensi* and *A. Culicifacies*, and their breeding was effectively checked.

Enquiries were made about malaria cases treated in the hospitals in the City and it was found that most of the patients had come from the mofussil for treatment. The stay of malarial patients in the City involved the risk of the dissimulation of the disease through malaria carriers yet, there was no large scale incidence of malaria in the City during the year. The freedom from inspection which the City enjoyed is, in no small measure, due to the effective campaign directed against breeding of the species responsible for the spread of the disease.

*Control of Anopheline mosquitoes* :—Of the two vectors of malaria *Anopheles Stephensi* and *Anopheles Culicifacies*, the former were found to breed in domestic wells in the City. Every well was, therefore, periodically inspected by the fish gangs who removed all floating matter from them and then examine for the presence of larvae. If any breeding was noticed, the well was treated with D.D.T. solution for the destruction of larvae. Larvicidal fish were then introduced in sufficient numbers. 22,375 wells were thus inspected and attended to in the year under report and kept free of breeding of this species of mosquitoes.

*Anopheles Culicifacies* were found to breed generally in ponds and tanks in the City. Cleaning of private ponds and tanks was undertaken by the department on payment of nominal charges. The amount so collected



was Rs. 2276-8-0 during the year. 33 public and private tanks were cleaned departmentally. Some private tanks were cleaned by the owners themselves but were subjected to constant inspection by the supervisory staff for taking action to prevent larvae breeding. The tanks cleaned departmentally also received periodical attention from the cleaning gangs for the removal of algal moss, weeds, etc., and for replenishing them with larvicidal fish. They also removed tank vegetation and trimmed the edges of the tanks.

*Anti-stegomyia operations* :—Special measures were also taken by a special staff for the control of *Aedes-Aegypti* in the region half of a mile around the port. This area was divided into eight sections with one *Stegomyia* Overseer in charge of each with necessary equipment and staff. These 8 squads did intensive inspection of buildings in this area and eliminated larval breeding from neglected drains, cisterns, fire buckets, overhead tanks and other breeding places. The survey of *Stegomyia* mosquito-house index has been brought down gradually to as low a figure as 0.02% against 5.9% when the survey was first commenced in 1936.

*General Control measures* ;—*Culex Fatigans* and *Anopheles subpictus* were the other prevailing mosquitoes. The former breed in storm water drains in the City and in cess-pools in the extended areas, where there is no under ground sewerage and the latter along the course of the three water ways, viz, the Coovum river, the Adyar river and the Buckingham Canal. The abatement of nuisance from these mosquitoes formed also a feature of Anti mosquito work. *Culex Fatigans* being carriers of Filariasis, much attention was devoted to their control in added areas of Sembium, Ayanavaram, Aminjikarai, Kodambakkam, Mambalam and Saidapet.

To keep the cess-pools in the added areas of the City free from larval breedings, bags of saw dust soaked in a mixture of diesel oil and kersosene oil with D.D.T. dissolved in it to the extent of 2% were immersed with weights and allowed to remain in them. This method ensured in gradual liberation of the oil mixture to form a thin layer of film on the surface of cess-pool sullage and thereby kill the larvae therein, and also served as a repellent to the female mosquito resorting the cese pools to lay eggs. Desilting of 2464 cess-pools was done periodically and about 36 lorry loads of silt were removed.

There is a net work of storm water drains about 48 miles in extent in the City and section, by sections these drains were taken for cleaning, brushing and petrolising once in four days. Their periodical attention prevented larvae from pupating and becoming adult mosquitoes, Kellys Drains, a facile sources of breeding in George Town Area, received special attention This drain was flushed with sea water twice a week by the Special Works Department and this step helped to control breeding effectively.

*Anopheles Sulepictus* was found to breed in the rivers of Coovum and Adyar. The floating moss and algal decomposition formed a facile breeding grounds for this species and the presence of matting fibre weeds afforded good shelter to the larval from the attacks of the larvicidal fish. To clear these weeds, a special gang of coolies was engaged. The edges of the water ways were treated with Paris Green, D D.T. or Gemaxine.

These water ways bred culicines as well in places where there was sewage contamination from Storm water drain endings and the drains from pumping stations and such breedings were arrested in the larvae stage itself.

Buckingham Canal formed a breeding place for the *Culex Fatigans* wherever there was sewage contamination in its course and *Anopheles Sulepictus* along its entire length. The edges of the banks were trimmed and weeds and floatage were removed as frequently as possible. Larvicidal



fish, *Gambusia*, were stocked in sufficient number to kill larval breeding along its course.

*House Inspection Work*:—House Inspection squads did weekly inspection of houses in some divisions, to eliminate breeding of mosquitoes. The total number of houses inspected for the year was 30,877. During the intensive house inspection carried out by the squads, breedings were eliminated from storing utensils discarded vessels, tins, broken pots, condemned tyres, etc., found in houses. Such benefit could not be extended to all the divisions for want of sufficient Complaint about mosquitoes revealed very often breedings in neglected house drains. In every such case, the breedings were destroyed and the residents of the house required to have the drains cleaned constantly and kept in a state of repair to allow the free flow of water.

*Destruction of Adult Mosquitoes*:—Destruction of adult mosquitoes was also undertaken whenever there were complaints of their nuisance in the City. On receipt of complaints investigations were made and the breedings were detected in place nearby or within bungalows and were destroyed immediately. D.D.T. was the insecticide chiefly used against adult mosquitoes in the form of 5% solution or suspension in case of anopheline and 10% solution against culicinius the latter being more resistant. It was sprayed on the wall surfaces and under roofs relying on its residual effect on the adult mosquitoes when they visited. A sum of Rs. 5 per 1000 sq. ft. surface was collected from private parties for such spraying. There were 34 requisitions for the destruction of mosquitoes and other insects in the dwelling houses. These were attended to and the amount collected during the year under report was Rs. 962-8-0.

## REPORT OF THE WATER ANALYST, FOR 1954

1. *Introduction*:—This is the 32nd Annual Report on the working of the Water Analyst's Laboratory. The year under report did not vary markedly from the previous years. The water supply to the city smelt very strongly of sulphuretted hydrogen and also contained appreciable amounts of iron which imparted both an inky and foul odour especially in the low pressure areas of the city for the major portion of the year. The dose of chlorine added to the filtered water varied between 1.25 and 3.36 p.p.m., which was nearly double that applied to raw water. The raw water after passing through the sand filters (each containing about 6" of fine sand only) became worse chemically and bacteriologically. Sulphuretted hydrogen was produced in amounts varying between trace and 1.2 m.g. per litre.

At last, The Government were pleased to accord sanction, the introduction of a 10 million gallon rapid sand filter plant.

2. *Scientific*:—Water for the city is drawn from three main systems:—(A) The Kortalarayar river system, (B) the infiltration gallery wells at Saidapet and Sembiam and (C) the shallow wells at Adyar, Kodambakkam and Saidapet. The changes in the physical, chemical and bacteriological conditions of the water in each of these three systems during the year are briefly recorded below:

(A) *The Kortalarayar River system*—(Figure I): The river Kortalarayar is dammed at Poondi, 32 miles away from the centre of the city and the Satyamoorti Sagar (reservoir) has been formed for storing the greater flood discharges which were running to waste into the sea. The stored river water is let down through the river bed and another channel (called the upper supply channel) into the Sholavaram reservoir and from the latter water is let down through the lower supply channel into the Red Hills Reservoir, which serves as the chief source of raw water supply to the Water Works at Kilpauk. The three sources were visited once a month during the year for collection of samples and the results of their examination are shown in the Water Analysts Tables III, IV and V.



(a) *The Sources of Raw Water Supply*:—1. The Satyamoorthi Sagar (Water Analysis Table III):—The total yearly rainfall at Poondi was 40·85" as against 31·89 last year. The highest rainfall of 12·13" was recorded in October. There was practically no rainfall in February, March, April and November. The average reservoir level varied from a minimum of 126·91' in July to a maximum of 134·04 in January.

It will be seen (from Water Analysis Table III) that the water was colourless and clear in January and February, hazy in March, greenish in April, May, June and July and yellowish during the rest of the year. The temperature of water varied from 28·0° to 37·0°C.

Chemically, the values for total solids varied from a minimum of 16·0 parts in September to a maximum of 30·0 parts per 100,000 in February; D. H. from a minimum of 7·9 in August to a maximum of 8·5 in February, March, April and June; dissolved oxygen from a minimum of 1·0 cc/l in February; Tidy's organic matter from a minimum of 0·14 in February to a maximum of 0·280 parts per 100,000 in May; albuminoid nitrogen from a minimum of 0·004 parts in October to a maximum of 0·040 parts per 100,000 in June and August; and the total hardness varied from a minimum of 5·2 parts in May, June and July to a maximum of 10·4 parts in October '54. Nitrites were found in minute traces and nitrates were absent. Phosphates were found to vary from nil to 0·001 part per 100,000 and silicates between 0·1 and 1·0 part per 100,000.

Coliforms flora were present in 1·0 c.c. and upwards for the major portion of the year.

2. *The Sholavaram Reservoir (Water Analysis Table IV)*:—The total rain fall recorded in the catchment area of this reservoir was 40·14" as against 32·60" in the preceding year. The maximum of 10·73" was recorded in October. There was practically no rainfall from February to May. The monthly average water level varied from a minimum of 48·25' in July to a maximum of 59·58 ft. in December.

The water was colourless from January to April and December and was discoloured yellow, pale green or brownish during the rest of the year.

The temperature of the water varied from a minimum of 27·0° in July to a maximum of 34·0° C in May.

Chemically, the values for total solids varied from a minimum of 10·8 parts in September to a maximum of 25·6 parts in June. P. H. varied from a minimum of 7·9 in October to a maximum of 8·8 in March; dissolved oxygen from a minimum of 1·2 cc/l. in June to a maximum of 7·2 cc/l. in September; chlorides from 2·1 to 4·7 parts per 100,000; Tidy's organic matter from 0·131 parts in October to 0·315 parts per 100,000 in May; and albuminoid nitrogen from 0·006 to 0·064 parts per 100,000. Nitrates were found in minute traces and nitrates were not found. Phosphates were found in traces in a few months. Silicates varied from minimum of 0·1 part in December to a maximum of 1·2 parts in June. Iron varied from a minimum of 0·001 part to a maximum of 0·020 parts and the total hardness from 6·0 parts to 10·6 parts per 100,000.

Coliform organisms were present in volumes varying from 0·1 c.c. to 10 c.c. and upwards.

3. *The Red Hills Reservoir (Water Analysis Table V)*:—In the catchment area of this reservoir, the total annual precipitation was 41·97" as against 32·34" in the previous year. A maximum of 11·12" was recorded in October. There was practically no rainfall from February to May. The monthly average water level varied from a minimum of 38·04 ft. in September to a maximum of 45·60 ft. in January.

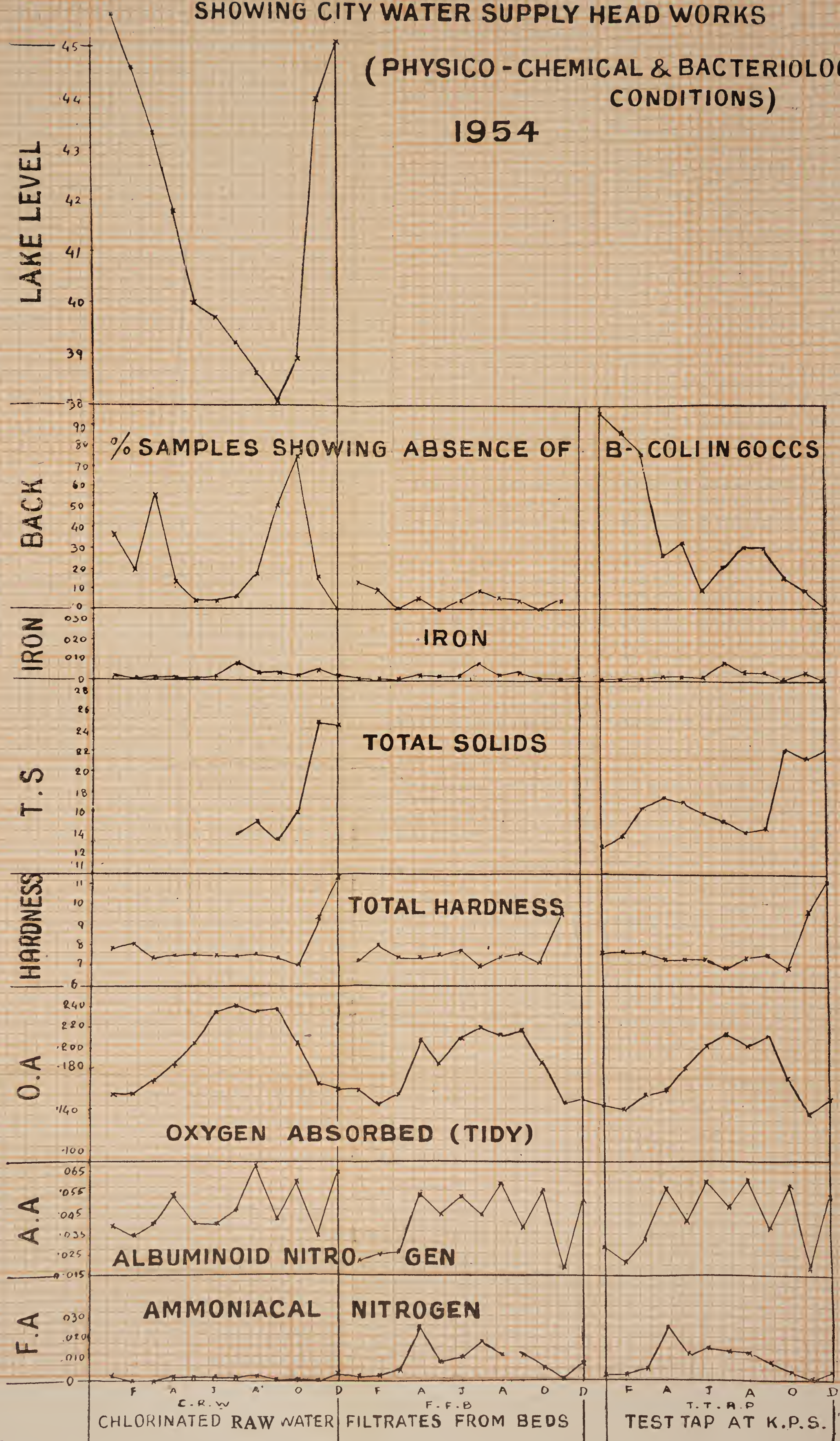
The colour of water was slightly yellowish almost throughout the year. The temperature of water varied from 28·0°C. to 33·0°C.







## 1954





Chemically, the total solids varied from a minimum of 12.8 parts in July to a maximum of 27.2 parts per 100 000 in March and April; D. H. varied from 7.9 in August to a maximum of 8.8 in April and May; dissolved oxygen from 1.0 cc/l. in June to a maximum of 6.0 cc/l. in February. Chlorides varied between 2.8 parts and 4.3 parts per 100,000. Tidy's organic matter varied between 0.115 parts and 0.273 parts per 100,000 and albuminoid nitrogen between 0.008 parts and 0.43 parts per 100,000. Nitrates and phosphates were not found. Iron varied between 0.001 and 0.006 parts per 100,000 and the total hardness varied from a minimum of 7.0 parts in January and March to a maximum of 11.8 parts in October.

Coliform organisms were found in volumes varying from 0.1 c.c. to 5.0 c.c. and upwards.

(b) *Chlorinated raw water at the Kilpauk end (Water Analysis Table VI)*:—The raw water reaching Kilpauk water works was chlorinated with gaseous chlorine, just a few minutes before reaching the sand filters. Samples of the chlorinated raw water were drawn for examination every day from one of the two raw water conduits and the weekly averages of the results of examination for some of the important tests are shown in Water Analysis Table VI. The range of variations of some of the important results in given below.

	Parts per 100,000.
P. H.	... 7.7 to 8.8
Chlorides	... 2.9 to 5.0
Total hardness	... 7.0 to 8.8
Organic matter :	
(a) Oxygen absorbed (Tidy)	... 0.142 to 0.259
(b) Albuminoid nitrogen	... 0.008 to 0.063
Iron	... 0.001 to 0.010
Average dose of chlorine (p.p.m.)	... 0.83 to 2.52

The percentage of samples showing absence of B. Coli in 60 c.c. varied from 0 to 56 indicating that the process was inefficient as in the previous year.

(c) *Sand filters and filtration (Water Analysis Table VIII)*:—There are 17 sand filters of which 10 to 13 filters were in commission every day for filtering 20 to 27 million gallons per day. They were worked with no fixed rate of filtration. The quantity of water thus strained varied from a minimum of 20.65 m.g.d. in January and July to a maximum of 26.63 m.g.d. in May. Everyday a sample of the filtrate from one of the beds was taken for analysis and the monthly averages of the results of analysis for some of the important tests are given below :—

	Yearly range
Ammoniacal nitrogen	Trace to 0.026 parts per 100,000
Albuminoid „	0.019 to 0.060 „
Oxygen absorbed (Tidy's)	0.145 to 0.221 „
Total hardness	6.9 to 12.3 „
Iron	Trace to 0.008 „
H <sub>2</sub> S (mg/litre)	„ to 0.010 „
Dose of chlorine (parts per million)	1.25 to 3.36
% samples showing absence of B. Coli in 60 c. cs.	0 to 13.



In spite of the application, a fairly high dose of chlorine to the raw water feeding, the sand filters the filtrates from individual beds were of poor bacterial/quality. So the following suggestions were made for improving the quality of the filtrates from each of the 17 sand filters.

(1) Sand washing should be done outside the bed and not inside the bed as it is being done.

(2) Sand which has been previously well washed and dried should be used for renewal.

(3) The accumulation of years of fine silt in the central collecting and side drains of each filter bed should be removed one by one as it goes out of action without resorting to complete overhauling.

(4) The process (3) should be repeated for each filter after 3 runs.

(5) Before starting each bed, the filter-media should be sterilized in such a way that there is a residual chlorine of 5-10 p.p.m. This residual can be got only if the suggestions 1 to 5 are systematically followed.

If the above suggestions are carried out, the life of a sand filter will not only be longer but the filtrates from all the filters also will be chlorinatable. The dose of chlorine for the filtered water will be far less than that for the raw water.

(a) *Test tap (Water Analysis Table No. VIII):*—Samples of water from the test tap at the Kilpauk Pumping Station were taken daily for analysis, and the results of some of the important tests are shown below:—

Yearly range parts per 100,000.		
Ammonical nitrogen	...	Trace to 0.026
Albuminoid nitrogen	...	0.018 to 0.061
Oxygen absorbed (Tidy)	...	0.138 to 0.214
Iron	...	0.001 to 0.008
% samples showing absence of B. Coli in 60 c.c. volumes	...	0 to 96

Table IX contains the chlorination data.

(c) *Distribution system Tables X, XI XII and XIII:*—Relating to Water Analysis in the appendix I show the results of analysis of samples drawn from the high pressure, low pressure and booster areas of the city distribution system. The range of variations in some of the important results is given below.

	H. P. areas.	L. P. areas.	Booster areas.
Ammoniacal N	0.002 to 0.007	0.001 to 0.014	nil to 0.013
Albuminoid N	0.029 to 0.064	0.016 to 0.056	0.015 to 0.057
Oxygen absorbed (Tidy)	0.140 to 0.226	0.134 to 0.216	0.104 to 0.196
Total hardness	6.9 to 11.5	7.2 to 10.9	7.1 to 1.09
Iron	0.001 to 0.018	0.003 to 0.016	0.002 to 0.013
% samples showing absence of B. Coli in 60 c.c.	0 to 90	0 to 68	0 to 90











(B) *The infiltration gallery wells at XIV, XV and XVI tables  
Sembiam and Saidapet (Water Analysis Tables XIV to XVI)*

Sembiam and Saidapet areas of the city are being supplied with water from the two infiltration galleries. The Sembiam water supply contains appreciable quantities of iron which is precipitated by treating the water with lime in the overhead tank itself. So, the water as distributed contains iron in suspension. The treated water has to be filtered before distribution.

In the case of Saidapet, the gallery water is chemically good and both the waters are being chlorinated in the wells from which water is being pumped out. The salient characteristics of the two waters are shown below :—

	Yearly range Sembiam.	(Parts per 100,000) Saidapet.
Ammoniacal nitrogen	Nil to 0.001	Nil to 0.001
Albuminoid „	Nil to 0.003	Nil to 0.002
Oxygen absorbed (Tidy)	0.018 to 0.125	0.015 to 0.086
P. H.	6.9 to 8.0	7.2 to 7.8
Total hardness	10.5 to 27.0	20.0 to 28.0
Total solids	24.0 to 48.0	55.0 to 75.8
Iron	0.004 to 0.033	Tr. to 0.004

Table XVI relating to water analysis in the appendix I contains the results of bacteriological examination of samples drawn from the distribution systems in Sembiam and Saidapet. These results have been satisfactory.

(C) *The shallow wells used as sources of water supply in the outlying areas of the city (Water Analysis Table No. XVII)*

The water from the well in Richard's Park, Saidapet, is chlorinated and used for supplying public fountains in Guindy. The waters from two wells located at Urur in Adyar are being pumped into the reservoir at Mandavalli, Mylapore, for supplying the new Gandhinagar Colony and other places at Adyar. The water from the shallow well which is located in the United India Colony at Kodambakkam is used for supplying public fountains in that area.

Of these shallow wells, excepting the two wells at Urur, Adyar, the two other wells, at Saidapet and Kodambakkam are totally unfit for drinking purposes.

(D) *Sterilisation of water mains for the removal of growths and deposits in the city distributory system :*

The above work which was started on 5-8-51 was continued also during the year under report and it was done at nights. Details of this work are shown in table No. XVIII relating to water analysis in the appendix I from which a summary is given below :

1. Total number of days when the mains were sterilised. 275.
2. Quantity of chlorine used. 3948 lbs.
3. Length of mains treated. 7 miles and 3 furlongs.



## 4. Details of mains treated :

(a) Main No.	2 and 3
(b) Length	1 mile ; 6 miles and 3 furlongs.
(c) Days.	16 ; 259.
(d) Chlorine (lbs)	3948 lbs.

## 5. No. of samples examined 544.

(a) No. taken before sterilisation	272.
(b) % samples showing absence of B. coli in 60 cc.	30%.
(c) No. taken after sterilisation	272.
(d) % of samples showing absence of B. coli in 60 cc.	79%.

## 6. Effects of the addition of chlorine on the distributory system are shown in table XVIII of water analysis in the appendix I.

(a) Brownish, flocculent, soft deposits were dislodged from the sterilized portion of the mains when scoured. These deposits consisted essentially of ferric oxide, organic matter and the iron bacterium *Siderocapsa* sp. and *Leptothrix ochracea*.

(b) An increase in the iron content immediately after sterilization and a reduction thereafter:

(c) An increase in the percentage of first class samples after sterilization.

From the foregoing, it will be seen that there is no doubt about the beneficial effect of sterilization of water mains in improving the general quality of water as supplied to the city. The incrustations in the pipelines are several decades old and therefore patient and persistent treatment is required to bring about a radical change. The staff employed for this purpose will have to be continued on a permanent basis as the progress of work has to be necessarily slow and as the incrustations respond to treatment only at the end of a week of heavy and continuous application of chlorine.

(E) *A sum of Rs. 580 has been received by way of fees for analysis of private supplies*

(F) *Standards of purity suggested by the Health Officer in connection with the installation of 10 million gallon rapid sand filter plant at the Kilpauk Water Works.*

The Health Officer, in reply to the note of Water Works Engineer dated 2-11-1954, suggested the following standards of purity for the city water supply.

(a) *Physical characteristics*: The turbidity of the filtered water shall not exceed 10 parts per million (Silica scale) nor shall the colour exceed 20 standard cobalt scale. The filtered water shall have no objectionable taste or odour in the cold or when heated to a temperature of 80°C.

(b) *Bacterial efficiency*: When the total colony count of the raw water exceeds 3000 colonies per m.l., the reduction in the colony count in the filtered water before chlorination shall be not less than 97 per cent.











When the colony count of the rain water is less than 3000 colonies per m.l., the filtered water shall not have a colony count more than 10 colonies per m.l.

The total colony count shall be the number of colonies appearing on nutrient agar after 48 hours growth at 37°C.

(c) *Chemical characteristics*: 1. The filtered water shall contain not less than 1.0 part per 100,000 of total alkalinity expressed in terms of calcium carbonate. The PH of the filtered water shall not be below 7.0 nor above 8.0.

2. The final filtrate from the rapid sand filter should show an averagereduction of not less than 45% in respect of (a) its content of albuminoid nitrogen; and (b) absorbed oxygen (Tidy's test for 4 hours at 26.7°C) over the corresponding averages for the raw water each month.

3. The average content of ammoniacal nitrogen in the filtrate from the rapid sand filters shall not exceed 0.002 parts per 100,000 reckoned during each month.

4. The filtrate shall not contain any residual chemical that may be added to the raw water in such quantity that can be detected by any recognised chemical test.

5. The required dose of chlorine for the filtrate shall not exceed 0.5 p.p.m.

6. The test period for the filters shall be not less than one full year, during which daily samples should be examined.

(d) *Wash water consumption*: The total quantity of filtered water required for back washing of the filters shall not exceed one per cent of the total quantity of water filtered from the filter plant in between the successive cleanings based on the average working of the units in a month.

(G) *Researches on the raw water of the Red Hills Reservoir*:

A summary of the two half-yearly research reports of the Govt. committee on water and sewage purification (G.O.Rt. No. 473 Health dated 30th Oct. 1954 and G.O.Rt. No. 183 Health, dated 24-3-1955) is given below:

(A) *Experiments on treating the Red Hills Reservoir water with chlorine by the break-point method prior to slow sand filtration*:

(i) *The quality of the raw water*:—The raw water had a fairly low turbidity in the months of January and February (9.1 to 9.9 p.p.m.) and it increased to 17.2 p.p.m. in June and later to a maximum of 19.6 p.p.m. in July. It came down to 14.4 in August, increased again to 18.3 in September. Thereafter the turbidity decrease gradually and reached 12.7 p.p.m. in December.

The dominant algal flora were chiefly the Blue-greens consisting of *Coelosphaerium*, *Microcystis*, *Anabaenopsis*, *Merismopedia* and *Vocillatona*. A fairly large number of Diatoms, Desmids, and Chlorococcales were also present.

(ii) *The quality of the filtrates*:—

(a) The filter worked for 46 days per run yielding 4,200 to 4,700 gallons of water filtered per square ft. of area cleaned.

(b) The percentage reduction in turbidity varied between 49 and 72.



(c) Almost cent percent improvement was noticed in the coliform flora.

(d) The percentage reduction in organic matter (Tidy) varied between 17 and 35 and between 2 and 39 for albuminoid nitrogen.

(e) The filtrate contained very small amounts of dissolved oxygen (0.05 to 0.38 parts per 100,000).

(f)  $H_2S$  was absent.

(B) *Treatment of the raw water with chlorimine followed by slow sand filtration.*

(a) The average length of run of this sand filter was 48-71 days yielding 3,600 to 7,100 gallons of filtered water per square feet of area cleaned.

(b) The percentage reduction in turbidity varied between 43 and 70.

(c) Almost cent percent improvement in the coliform flora.

(d) The percentage reduction in organic matter (Tidy) 6 and 22 and between 0 and 31 in respect of albuminoid nitrogen.

(e) The filtrate contained very small amounts of dissolved oxygen (0.05 to 0.38 parts per 100,000).

(f)  $H_2S$  absent.

The physical chemical and bacteriological results generally agreed with the earlier findings.

So, the Govt. Committee concluded that these treatment measures should be carried out on a plant scale on a battery of seven sand filters at the Corporation Water Works. The Commissioner of the Corporation in his letter W.W.D.C. No. 10081/1951 dated 27-3-54 stated that the Council was agreeable to the above proposal of the Govt. Committee on one row of seven filter beds at Kilpauk Water Works. The Govt. Committee at its meeting held on 13th May 1954 resolved to take up the proposal.

(b) A summary of the results of experiments carried out by the Corporation Analyst for finding out the exact causes for the production of  $H_2S$  in the Madras slow sand filters is given in Appendix II.

S. V. GANAPATI, B.A., M.Sc., A.R.I.C.  
*Water Analyst.*

#### REPORT OF THE PUBLIC ANALYST FOR THE CITY OF MADRAS FOR 1954.

The number of samples analysed in the Public Analyst's Laboratory, during the year 1954, was 5,720 as against 6,166 in 1953. Among these samples, 5,303 were samples analysed under the Madras Prevention of Adulteration Act, 1918, as against 5,735 in 1953.

Of the 5,303 samples analysed under the provisions of the Madras Prevention of Adulteration Act, 1918, 2,891 samples were genuine and the remaining 2,412 samples were found to be adulterated. The percentage of adulterated samples for the year 1954 was 45.5 against 44.8 in 1953.

The samples consisted of milk, butter, ghee, gingelly oil, groundnut oil, cocoanut oil, coffee powder, tea, ghee substitutes, turmeric, arrowroot and other articles. A statement of the samples analysed in 1954 and in the five previous years is given in the Appendix I (Food Analysis-State-



ment No. 1). A graph showing the number of samples analysed and the percentage of adulteration, each year from 1933 is also appended to this report.

It would be seen from Statement No. 1 that the percentage of adulterated samples had been steadily rising from 1949 onwards with the peak level of 54.8 in 1952. With break in the drought conditions that prevailed for some years and the partial easing of the food situation, it is natural to expect a fall in the percentage of adulteration. The years 1953 and 1954 have recorded a decrease in the adulteration of foods though not to the extent that was expected.

The percentage of adulteration in 1954 was 45.5 as against 44.8 in 1953, showing that the rate of adulteration in 1954 has remained more or less on a level with that of 1953. Although the adulteration has not risen appreciably, there is no room for complacency since the figure of 45.5 is deplorably high, showing that we are still a long way off from our goal of completely suppressing the un-social activity of the food adulterators.

As in previous years, milk again recorded a high figure for the percentage of adulteration. It is well-known that milk is the most perfect of foods available to man and it is an essential protective food for children. The importance of putting down adulteration of milk cannot, therefore, be overrated. The most important step to be taken in this direction would be the removal of the innumerable small dealers from the trade, the entire supply of milk to the city being undertaken by the Co-operative milk supply societies, of which the individual cattle owners can become members. With such responsible milk supply societies, the control of the purity of the supply of milk would be easy and effective.

An appreciable degree of adulteration has also been noticed in butter, ghee, gingelly oil and coffee powder. During the year 1954, coffee powder has beaten the long-standing record of milk in the matter of adulteration. The reason for this should be sought in the wider popularity of coffee as a beverage combined with the high price of this article.

56.1 per cent of the milk samples were adulterated in 1954 against 66.7 in 1953. Though there has been an appreciable fall in the adulteration of milk during the year under report as compared with 1953, the rate still continues to be high inspite of the fact that the Corporation is at present taking more than 3,000 samples of milk per annum. As pointed out in my previous reports, so long as the price of milk is high and so long as the fines levied by the Magistrates are not sufficiently deterrent, the temptation to make easy profits by adulteration would continue.

The percentage of adulteration of butter in 1954 was higher than in 1953 the respective figures being 36.1 and 30.3. The adulteration of ghee also showed an increase during the year 1954, the percentage of adulteration in 1954 being 27.1 against 19.3 in the previous year. There has been a sudden spurt in the adulteration of gingelly oil during the year under report, the percentages of adulteration of this article in 1954 and 1953 being 33.8 and 14.5 respectively. The reason for the adulteration of groundnut oil, which has always been low showed a slight increase during the year under report, the percentages of adulteration in 1954 and 1953 being 4.1 and 3.3 respectively. The adulteration of cocoanut oil in 1954 though still comparatively low showed a slight increase over the figure for 1953, the percentages of adulteration in 1954 and 1953 being 7.4 and 2.8 respectively. There was no instance of adulteration of any edible oil with mineral oil during the year under report. The adulteration of coffee



powder has shown a considerable increase during the year under report, the percentage of adulteration being 56.7 against 32.3 in 1953. Tea was the only article which has been continuously genuine for a number of years since 1933. In fact, between 1933 and 1954, the only year in which adulteration of tea has been noticed was 1951. In 1952 and 1953, no adulteration of tea was noticed. Again in 1954, 3 out of 21 samples of tea analysed were found to be adulterated. The colouring of turmeric with lead chromate has also shown an increase during 1954 as evidenced by the fact that 9 out of 22 samples of turmeric contained lead in excess of the prescribed limit.

The analysis of samples of arrowroot was continued during the year under report. In commerce, the term arrowroot includes a number of starches besides the genuine arrowroot (starch of *Maranta arundinacea*) each of the substitute starches having a separate geographical prefix to the term arrowroot. Under the new rules regarding arrowroot, the sale of any starch other than that of *Maranta* is permissible only if the term 'Arrowroot' is followed by the words 'Not recommended for invalid diet'. Only two samples amongst the 39 samples of Arrowroot analysed proved to be genuine arrowroot and none of the remaining 37 samples had a label as per the labelling rules regarding the sale of arrowroot substitutes.

The details regarding the various articles of food analysed during the year under report are given below:

*Milk*:—3,141 samples of milk were analysed. Of these, 1,172 samples were Cow's milk, 1,392 were Buffalo's milk, 2 samples were Goat's milk, 466 samples were sold under the description of Mixture of Cow's and Buffalo's milk, 81 samples were described as Milk without the qualification of Cow's or Buffalo's, 15 samples were described as Reconstituted Milk and 13 samples were described as Powder Milk.

Of the 1,172 samples of Cow's milk, 466 were genuine and 726 were adulterated. Among the adulterated samples, 575 contained Added Water ranging from 1 to 80 per cent. There was deficiency in fat in 59 samples, the extent varying from 10 to 100 per cent, and 92 samples were deficient in fat in Addition to containing added water. The average values of fat and solids-not-fat for the 446 genuine samples of Cow's milk were 4.7 per cent and 9.1 per cent respectively as against the average values of 5.1 per cent fat and 9.2 per cent solids-not-fat in 1953.

Of the 1,392 samples of Buffalo's milk, 673 were genuine and 719 were adulterated. Among the adulterated samples, 564 contained added water ranging from 1 to 57 per cent, 77 samples were deficient in fat the extent varying from 13 to 100 per cent and 78 samples were deficient in fat besides containing added water. The average values of fat and solids-not-fat for 673 genuine samples of Buffalo's milk were 6.6 and 9.8 per cent respectively as against the average values of 6.8 per cent fat and 9.7 per cent solids-not-fat in 1953.

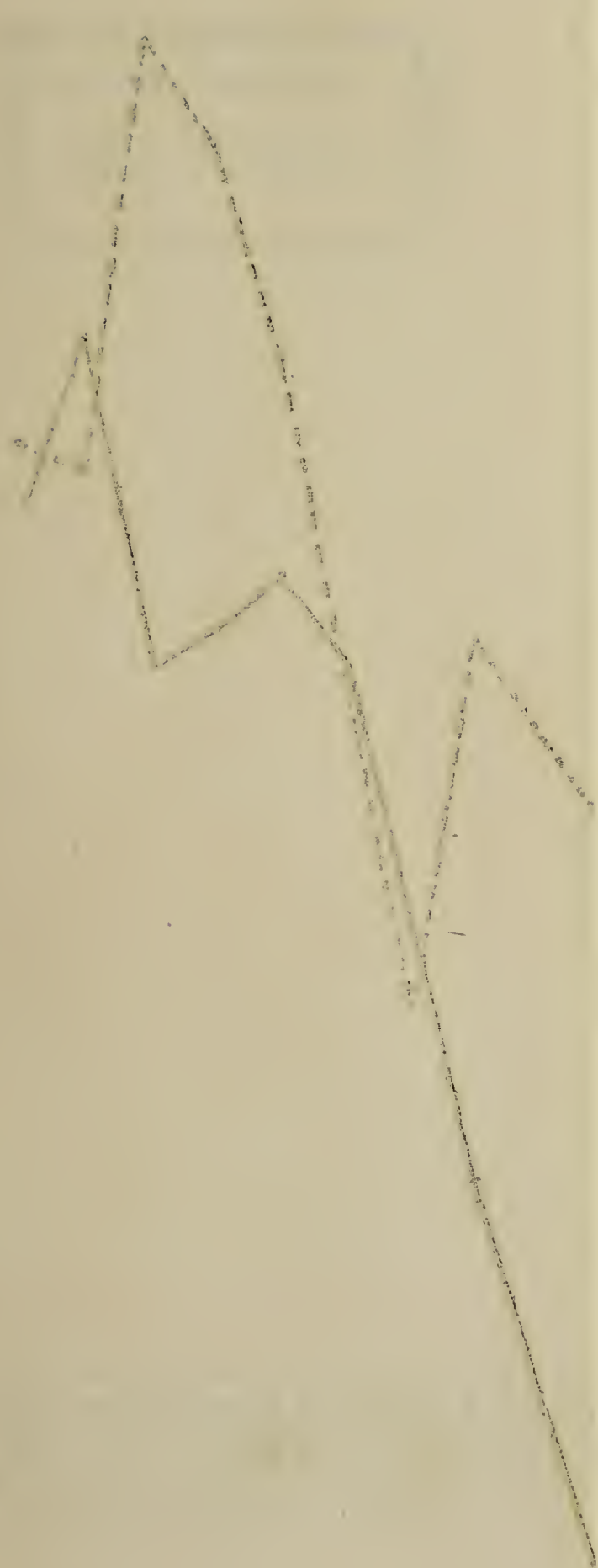
The 2 samples of Goat's milk were adulterated and they contained added water to the extent of 19 per cent and 38 per cent respectively.

Among the 466 samples of mixture of Cow's and Buffalo's milk, 196 were genuine and 270 were adulterated. Among the adulterated samples, 227 contained added water ranging from 3 to 82 per cent, 19 samples were deficient in fat the extent being from 13 to 100 per cent and 24 samples were deficient in fat besides containing added water.

Of the 81 samples described as Milk without any qualification, 52 were genuine and 29 were adulterated. 21 of the adulterated samples contained added water ranging from 2 to 28 per cent, two samples were deficient in fat and the remaining 6 samples contained added water and were also deficient in fat.

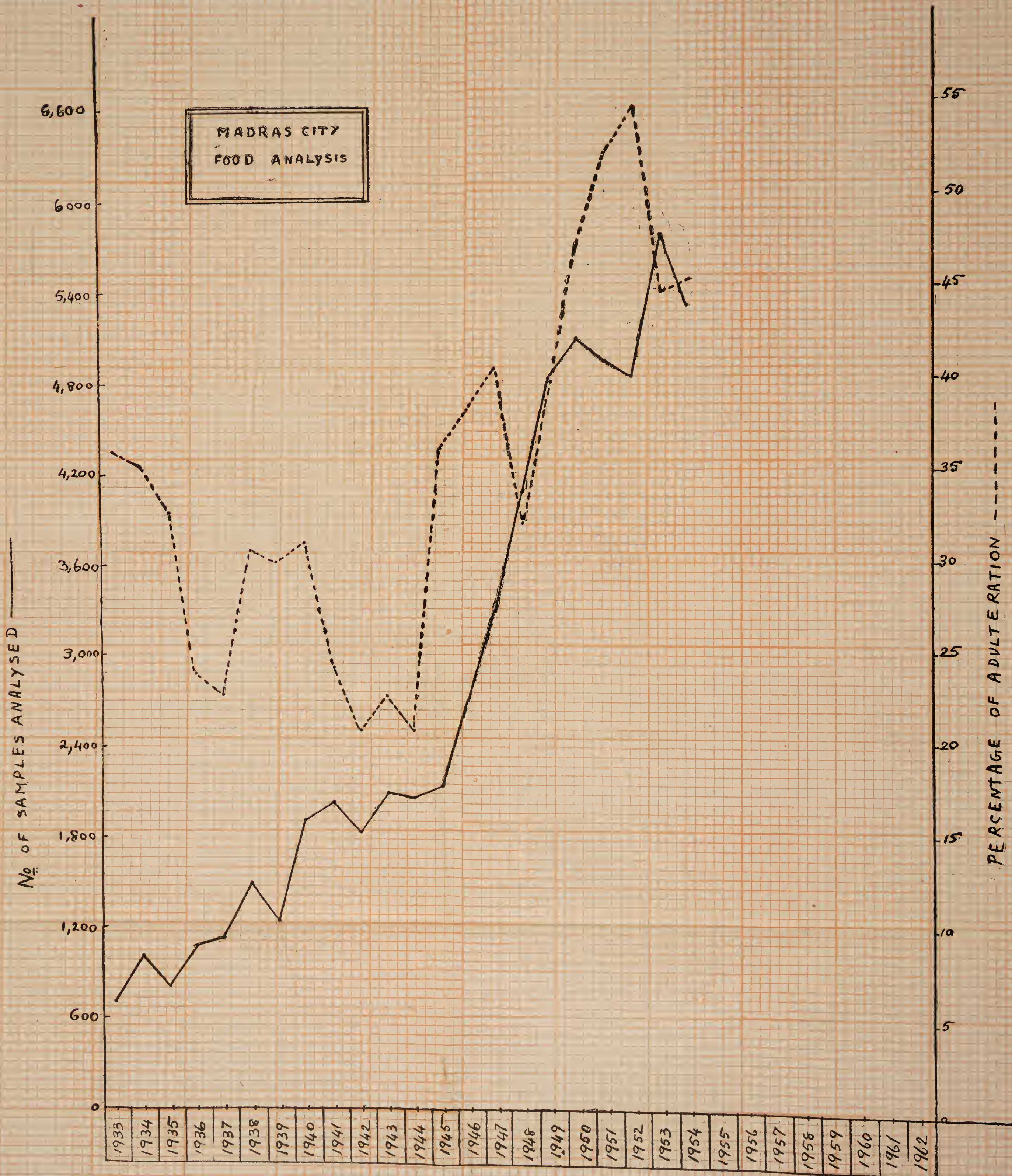


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15 samples of Reconstituted Milk were analysed and the samples which did not satisfy the prescribed standards of purity for cow's milk were reported as adulterated. 8 of these 15 samples were adulterated. Among the adulterated samples, there was fat deficiency to the extent of 20 and 27 per cent respectively in two samples, deficiency in solids-not-fat to the extent of 9 per cent in one sample and the remaining 5 samples were deficient in both fat and solids-not-fat.\* Of the 13 samples described as Powder Milk, which is the expression used by some local vendors to describe "Reconstituted Milk" prepared from "Milk Powder", two were deficient in fat to the extent of 67 and 93 per cent respectively, two samples were deficient in solids-not-fat to the extent of 4 per cent each and the remaining 4 were deficient in both solids-not-fat and fat.

Among the 3,113 milk samples of all the above categories excluding the 15 samples of Reconstituted Milk and 13 samples of Powder Milk 1,589 samples contained added water and the average content of added water in these 1,589 samples was 19 per cent as against 22 per cent during the year 1953.

*Butter*:—601 samples were analysed, of which 384 samples were genuine and 217 were adulterated. In 165 of the adulterated samples the water content ranged from 21.3 to 76.2 per cent, the prescribed maximum limit for water being 20 per cent. 55 of these 165 adulterated samples also contained fat other than milk-fat besides containing excess water. The remaining 52 adulterated samples of butter having water content within the prescribed maximum limit, however contained foreign fat. The extent of adulteration among the 107 samples of butter which contained Foreign Fat ranged from 6 to 66 per cent.

The average water content of the 384 genuine samples of butter was 17.3 against 17.7 during 1953 and the average water content of the 165 samples which contained excess water was 44.1 as against 45.2 in 1953. Among the 107 samples of butter which contained foreign fat, the average percentage of foreign fat was 34 as against 37 in 1953.

It may be mentioned that the adulteration of butter with foreign fat which was non-existent for nearly two decades has been very much on the increase during the years 1952, 1953 and 1954. Therefore, the general impression among the public that they could get pure ghee by buying butter and melting it into ghee is now a days incorrect.

*Ghee*:—798 samples were analysed. Of these, 216 samples were adulterated with fat other than milk-fat, the common foreign fat used for the adulteration of these samples being Vanaspati (mostly hydrogenated groundnut oil). The extent of adulteration ranged from 11 to 99 per cent. The average admixture of foreign fat in the adulterated samples was 62 per cent.

*Gingelly oil*:—201 samples were analysed, of which 68 were adulterated with groundnut oil, the extent being from 10 to 75 per cent.

*Groundnut oil*:—123 samples were analysed, of which 5 samples contained gingelly oil varying from 30 to 100 per cent. These 5 samples were reported as adulterated.

*Cocodanut oil*:—163 samples were analysed and 12 of these were adulterated with groundnut oil, the extent being from 5 to 55 per cent.

*Coffee powder*:—120 samples were analysed, of which 114 samples were sold as coffee powder and 6 as coffee and chicory mixtures. Of the 114 samples of coffee powder, 62 were adulterated. Of the adulterated samples, 18 samples were adulterated with Bengal Gram, 5 samples with



Pea, 5 samples with Date seed, one sample consisted of 100 per cent chicory and the remaining 32 samples were adulterated with preparations containing various proportions of more than one of the adulterants, Bengal Gram, Pea and Date seed.

Six samples were sold as Mixture of Coffee and Chicory. All the six samples were adulterated. None of these contained any chicory. One of the samples contained Pea, one contained Date seed and the remaining four samples contained both Bengal Gram and Date seed.

*Tea*:—21 samples were analysed. 18 of these were genuine and 3 were adulterated. Of the adulterated samples, one contained 10 per cent Black Gram husk and two contained 22 per cent foreign leaf and 3 per cent sand and 15 per cent foreign leaf and 5 per cent sand respectively.

*Ghee substitutes*:—31 samples were analysed, of which 6 samples consisted of mixture of ghee and Vanaspati and the remaining 25 samples consisted entirely of Vanaspati (mostly Hydrogenated groundnut oil) of various brands and makes.

*Other articles*:—There were 104 samples under this head. These consisted of 35 samples of Thoovar Dhall, 22 samples of Turmeric, 39 samples of Arrowroot, 2 samples of Pattani Flour (Pea flour), 5 samples of Chicory and one sample of Mysore Pak.

Out of the 35 samples of Thoovar Dhall, 6 were reported as adulterated as they contained a coal-tar colour, the addition of which is prohibited under the Madras Prevention of Adulteration Rules, 1932.

Of the 22 samples of Turmeric, 9 were reported as adulterated as they contained lead, the extent being from 10 to 80 parts of lead per million parts of the samples (limit 5 parts per million).

Out of the 39 samples of Arrowroot, two samples were genuine. These two samples consisted entirely of Maranta Starch (the starch derived from the rhizomes of *Maranta arundinacea*). Of the remaining 37 samples, 34 consisted of 100 per cent Tapioca starch (starch of *Manihot utilissima*) and two samples consisted of 100 per cent Curcuma starch (starch of *Curcuma angustifolia*) and the remaining one contained a mixture of Tapioca and Wheat starches.

Two samples of Pattani (Pea) flour were analysed and both are genuine.

Of the 5 samples of Chicory, two were genuine and 3 were adulterated. 2 of the adulterated samples contained 100 per cent Date seed and the remaining one sample contained 10 per cent coffee and 90 per cent of a mixture of Bengal Gram, Date Seed and Mahua flour.

One sample of Mysore Pak was analysed with a view to finding out whether the ghee used for the preparation was genuine and the result of analysis showed that genuine ghee had been used for the preparation.

Besides the formal samples dealt with above which were taken under the Madras Prevention of Adulteration Act, 415 miscellaneous samples were examined in the laboratory during the year under report. Of these, 353 were samples of milk taken informally from the Madras Co-operative Milk Supply Union in order to check the purity of the milk before it was distributed to the city. These were in addition to the formal samples taken regularly from the sales depots and delivery boys of the Union, which are included among the formal samples dealt with in the earlier part of this report.



A statement of the miscellaneous samples is given below:—  
 Nature of sample. Result of analysis.

353 samples from the Madras Co-operative Milk Supply Union.	351 samples were genuine and gave solids-not-fat above 9.0 per cent and 2 samples which gave solids-not-fat between 8.0 and 9.0 per cent were reported as below standard.
21 samples of milk from the Health Department.	14 samples were genuine, 6 contained added water ranging from 4 to 20 per cent and one sample was deficient in fat besides containing added water.
5 samples of Milk Powder from the Health Department,	4 samples fit for consumption and 1 sample unfit for consumption.
1 sample of butter from the Health Department.	Genuine.
8 samples of Gingelly oil from the Health Department.	7 genuine and one adulterated.
3 samples of coffee Powder from the Health Department.	All genuine.
2 samples of curry powder from the Health Department.	Both genuine.
1 sample of bread from the Health Department.	Excessive acidity and therefore unsuitable for invalid diet.
1 sample of buttermilk from the Health Department.	Fat entirely absent in the sample.
1 sample of Tea Dust from the Health Department.	Adulterated with foreign leaf and sand.
1 sample of Tincture quinine.	Contained only 0.1 grain of quinine per fluid ounce of sample.
18 samples of Transformer Oil from the Electrical Department.	Reports on the inorganic and organic acidities were made.

A tabular statement of the action taken on the adulterated samples of 1954 and those of 1953 pending disposal on 1st January 1954 is given in the Appendix (Food Analysis — Statement No. 11).

The number of samples reported as adulterated during the year under report was 2,412. Action taken in respect of these samples is given below:

Seizure and forfeiture of articles	7
Warning of vendors	80
Prosecution of vendors	2325
	<hr/>
Total	2412
	<hr/>



Of the 2,325 prosecutions instituted, convictions were obtained in 1,335 cases. There were 2 withdrawals and 2 acquittals and the remaining 986 cases were pending disposal on 31st December 1954. 630 convictions were obtained among the cases relating to the period prior to 1st January 1954.

The total number of convictions for the sale of adulterated articles of food in 1954 was 1,965 as against 2,175 in 1953. The amount of fines imposed in 1954 was Rs. 38,544 against Rs. 44,786 in 1953. The average fine per conviction in 1954 was Rs. 20 against Rs. 21 in 1953.

During the year under report, there were 4 convictions under section 14 (3) of the Madras Prevention of Adulteration Act for preventing the Food Inspectors from taking samples under section 14 (1) of the Act and one conviction for giving a false warranty under section 6 A (1) of the Act. The total fines imposed in these cases amounted to Rs. 70.

The following persons continued as my assistants during the year under report:

1. Sri S. Sundaram, M.A.
2. Sri R. Ramalingam, M.Sc.
3. Sri V. V. Ramana Rao, M.Sc.
4. Sri C. Rajaganapathi, B.Sc.

During the year under report, I was on leave from 11th August 1954 to 31st December, 1954, during which period, Sri S. Sundaram, my first Assistant, acted as Public Analyst in my place.

I have again to point out as I have done in my previous annual reports, that the fines imposed in Food Adulteration cases have been far from deterrent. When it is remembered that the Prevention of Adulteration Act has been in force in the city for twenty-four years, it can be easily understood how meagre and inadequate the fines have been in 1954, the average fine per conviction being only Rs. 20. It is impossible to achieve any appreciable success in preventing adulteration of food unless the fines are sufficiently deterrent. But, as this report is being written, it has been noticed that the fines imposed in 1955 have shown a welcome upward trend. It is certain that higher fines would sooner or later bring down the incidence of food adulteration appreciably.

Before concluding, I have to make mention of the Central Prevention of Food Adulteration Act, 1954, which after having been passed by the two Houses of the Central Legislature received the assent of the President on 29th September 1954. It is expected to come into force very shortly. On the enforcement of the Central Act, Prevention of Food Adulteration Acts of the States would stand repealed. Besides ensuring uniformity in the administration of the laws relating to Food Adulteration throughout the Indian Union, the Central Act prescribes heavy and deterrent punishments for the guilty vendors in Food Adulteration cases including imprisonment for second and subsequent offences. When the new Act gets into its stride, it is expected that the unsocial elements in the food trade, namely, the food adulterators would find it difficult to carry on their nefarious activities and the public would consequently be able to get pure unadulterated food without difficulty, a consummation devoutly desired by every one except the food adulterator.

V. VENKATACHALAM, M.A., A.R.I.C.

*Public Analyst.*



## REPORT OF THE MADRAS PORT HEALTH OFFICER, MADRAS FOR THE YEAR 1954

1. 567 vessels with 36,217 crew and 37,252 passengers were inspected on arrival during the year. None of these vessels were infected.

Out of 567 vessels leaving this port during the year under review, only 378 vessels with, 26,697 crew and 24,995 passengers were inspected at the time of departure for foreign ports.

2. Five cases of second hand imported clothing and blankets were disinfected before the same were released by the customs authorities.

Bedding, clothing, etc. of 1,609 new crew were inspected and disinfected before articles were taken on board.

3. Lascar's provisions of 68 vessels and 247 tins of ghee and 5 tins of mustard oil were inspected and sealed before being taken on board. In all one sample of ghee was collected and sent for analysis. It was found that the ghee in question was genuine and according to specification laid down.

4. The port Health Officer Madras, inspected unclaimed articles and food stuffs at the request of the Chairman, Madras Port Trust. These consisted of mostly damaged stuff lying unclaimed for a long time. The following were examined during the year :—

(i) 137 lots of unclaimed food stuffs were examined and only 52 lots were found fit for human consumption.

5. 437 seamen trainees, seamen for continuous certificates of discharge and other candidates for employment as seamen, were medically examined and certificates of fitness or otherwise issued.

6. On receipt of radio messages from the Masters of 4 vessels at sea seeking medical advice in connection with sickness on board the vessels necessary advices were sent immediately to the Masters concerned.

7. Sanitation of the Port Area was looked after by the Madras Port Trust and maintained satisfactorily. Storage tanks of water supply of the Port Area, were cleaned regularly and water from these sources was analysed at regular intervals. Measures were taken to rectify the defects when noticed.

8. 16 Doratisation Exemption certificates and 5 permits were issued, thereby collecting a total amount of Rs. 1,728 as fees.

M. J. H. WRITER,  
*Port Health Officer, Madras.*

5-4-1955.

## REPORT ON CHILD WELFARE SCHEME FOR 1954

The Child Welfare Scheme, continued to render useful service to the citizens during the year under report. There were 30 Child Welfare Centres at the commencement of the year. 4 new centres were opened in divisions 6, 8, 23 and 29 thus bringing the total to 34 centres at the end of the year. In 17 of these centres, maternity wards are attached, the total bed strength being 226.

*Serological Examination of blood of ante-natal cases:*—Serological examination of blood, was conducted of all ante-natal cases that attended the six centres mentioned herein (viz.) Choolai maternity Home, Saidapet, Sanjeeviroyanpet, Triplicane, Pulianthope and Washermanpet Child Welfare Centres.



In their review on the Administration Report for 1951-52 Government have suggested that examination of blood might be conducted in all centres. Due to pressure of work at the Public Health Laboratory the number of blood specimens could not be increased. Efforts are, however, being made to introduce blood testing in all the centres by stages. During the year under report 4 more centres viz. George Town, Sembiam, Purasawalkam and Trevelyan Basin Centres, started examining blood. The number of centres that conducted blood test was 10 at the end of the year. In all the positive cases, treatment by penicillin supplied by UNICEF was given free of cost. Figures regarding the number of blood samples examined, number of positive cases that took full course, and partial treatment, during the year are given below:

Total Number of samples examined.	Number of positive cases.	Number of positive cases that took full course of treatment.	Number of positive cases that took partial treatment.	Number of positive cases that did not turn up for treat- ment inspite of persuasion by the staff.
13,995	969	379	215	375

*Creches:*—Three Creches were maintained by the Child Welfare Scheme at Royapuram, Chetpet and Broadway. They are intended for the benefit of working class parents whose combined income is Rs. 50 or below per mensem. The parents leave their children at these creches before they go out for work in the mornings and take them back to their home in the evenings, on their return from their workspot. During their stay in the creches, the children are given bath, fresh and clean clothing, nourishing food and adequate rest. They play games both indoor and outdoor and attend nursery classes. Action songs, story telling and prayer are part of the programme in the nursery classes. All minor ailments of the children are promptly attended to by the doctor in charge and are treated forthwith. The average number of children nursed daily in Broadway, Royapuram and Chetpet creches was 41, 24 and 22 respectively.

*Staff:*—Captain (Miss) C. N. Rukmini, M.B.B.S., Lady Superintendent, was in charge of the Scheme during the year. There were 31 Assistant Surgeons including two Relieving Medical Officers, 40 qualified Health Visitors, 3 General Trained Nurses, 240 Midwives and 25 compounders under the Scheme.

*Pre-natal Clinics:*—The Pre-natal work forms an important link between expectant mothers and the Child Welfare Scheme. Pre-natal work is conducted by the Assistant Surgeons thrice a week regularly in each centre. The expectant mothers are given thorough medical check-up on their first visit and thereafter re-examined once a week or a fortnight as the individual cases demand. 39,991 expectant mothers attended the clinics and were given medical advice and treatment by the Asst. Surgeons against 36,185 in the previous year. An appreciable number of mothers were benefitted by instructions, advice and treatment given at these centres.

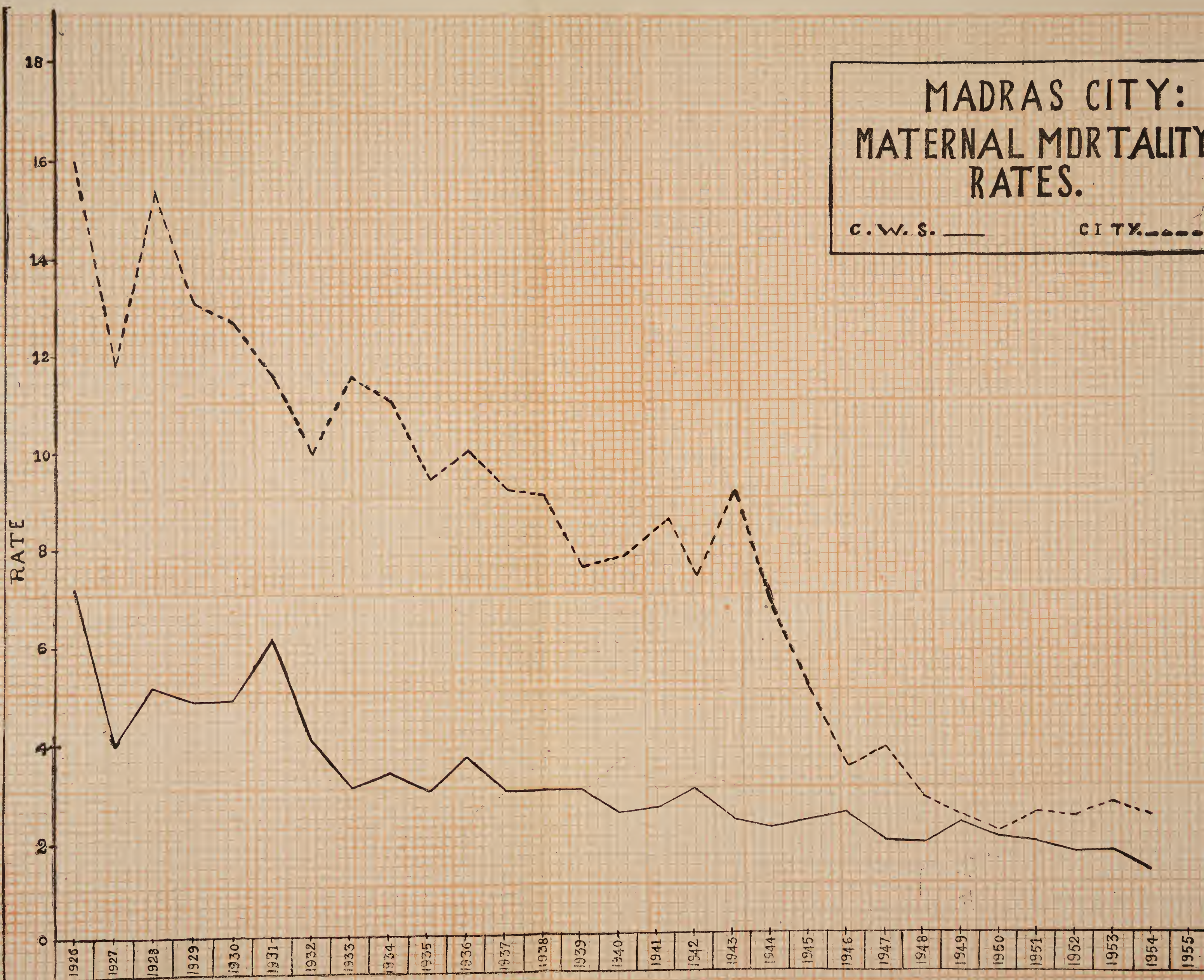
*Maternity service:*—The total number of births in the City during the year was 59,256. The number of labour cases that came under the care and observation of the Scheme was 29,209 against 27,219 in the previous year. 14,405 births were conducted in the Corporation Maternity wards during the year while the figure for the previous year was 12,389. The number of house visits paid by the Midwives was 2,36,196, the Health Visitors 1,63,195 and the Assistant Surgeons 17,792. Among the births conducted by the Child Welfare Scheme there were 233 twins and 732 stillbirths.



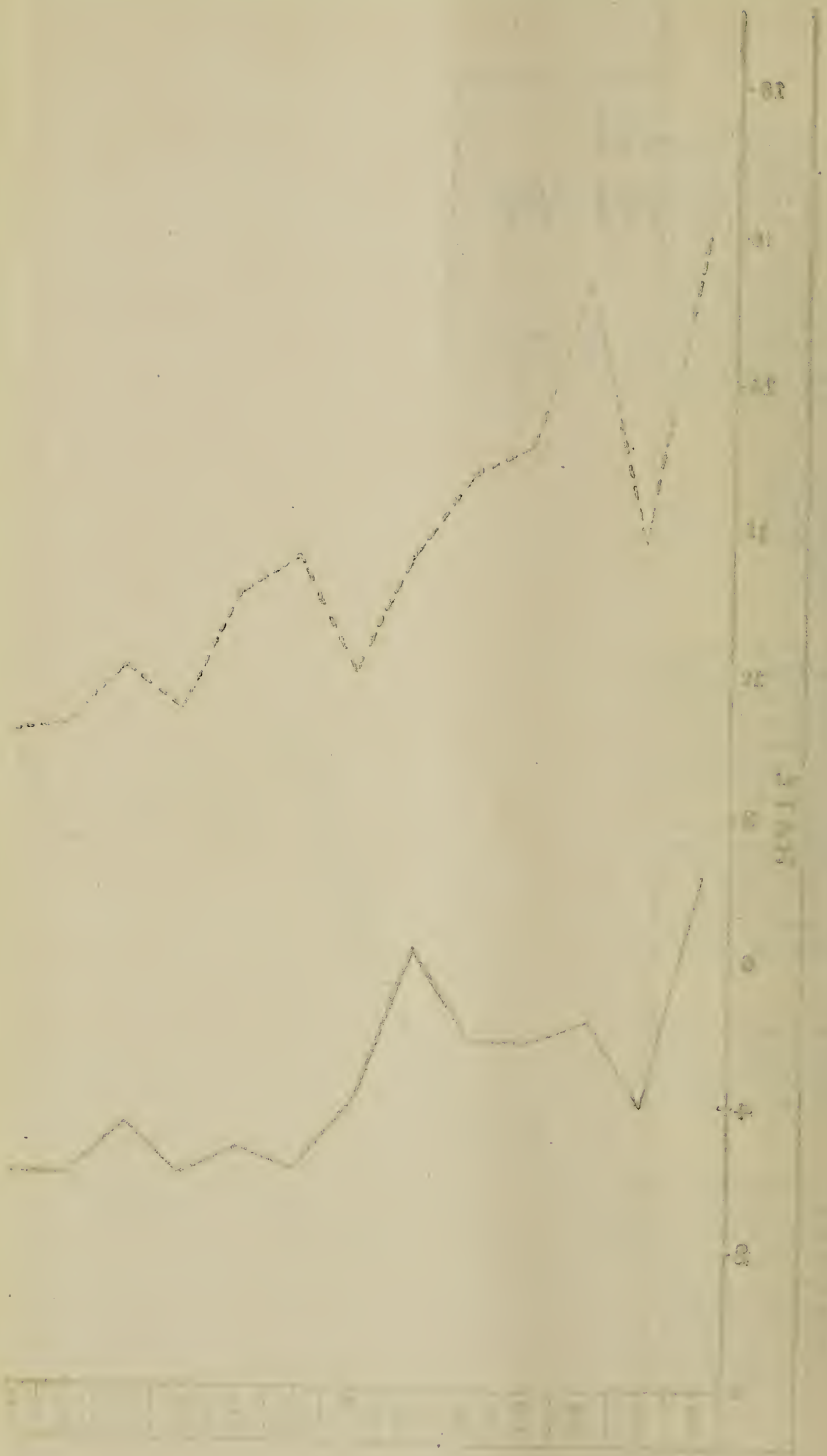
MADRAS CITY:  
MATERNAL MORTALITY  
RATES.

C. W. S. —

CITY. - - - -









*Maternal Mortality:*—Out of 29,209 labour cases that came under the care and observation of the Scheme, 37 cases of maternal mortality were recorded as noted below against 48 cases in the previous year. The maternal mortality rate works out to 1.27 per mille while the rate was 1.76 per mille, in 1953.

	1954	1953
Child Welfare Scheme	—	4
Hospitals	35	43
Private doctors	1	1
Vaidians	1	..
	—	—
Total ..	37	48
	—	—

*Infant Mortality:*—Out of 27,219 births in the year 1953, 732 were still-born. The remaining 26,487 babies were kept under observation during the first year of life in 1954 against 31,370 babies kept under observation during 1953. The Mortality among live births was 2,922 against 2,305 in the previous year. 1,866 babies left the City or were otherwise not traceable as against 2,439 in the previous year. The infant mortality rate is 110.31 per mille against 114.23 per mille in 1953.

*Out-patient clinics:*—The Assistant Surgeons conducted out-patient clinics in all the centres, as usual. Infants, Pre-school children and expectant and nursing mothers were examined, advised and treated for minor ailments. 57,492 infants, 24,778 pre-school children 62,080 nursing mothers and 39,991 expectant mothers represent the new cases that were treated and advised. The total number of cases attended to was 6,12,257 inclusive of 4,27,916 old cases.

*Family Planning:*—One more clinic was opened in Ashok Vihar, Health and Recreation centre, during the year under review in addition to the three Family Planning Clinics at Choolai Maternity Home, George Town and Washermanpet Centres. These clinics continued to render useful service to multiparous women and those resorting for advice on planned parenthood. The Assistant Surgeons of these centres conduct clinics twice a week. Apart from giving mere advice on proper spacing of children or limiting the family, the clinics are also supplying equipment at a nominal charge of annas eight per set of contraceptives against the actual cost of Rs. 4-14-0 per set. The total number of persons advised and the number of sets of contraceptives issued during the year was 999 and 137 respectively.

In order to solve some of the Social and Economic problems the Government of India has chosen to encourage the opening of Family Planning Clinics in the country by sanctioning a grant-in-aid. To implement the suggestion made by the Government of India, and to afford facility to those of the citizens in need of such advice, the City Council has decided to open 6 more Family Planning Clinics in the City and to maintain them even after the grant-in-aid is stopped by Government of India. The clinics have since been opened. It is hoped that multiparous women especially those belonging to the poorer class will take advantage of these clinics and benefit by the advice given there.



*Ambulance:*—Three ambulance vans were in service during the year. 1,345 cases requiring hospitalisation were transported by these vans to various maternity hospitals in the city.

*Milk supply:*—Cow's milk was continued to be supplied to indigent and ill-nourished infants. The total number of such infants fed with fresh milk was 2,582.

During the year, Child Welfare Scheme received 419 drums of skimmed milk powder as gift from the UNICEF and another quantity of 30 drums from the American National Red Cross Society. This milk powder was reconstituted and supplied to deserving infants, toddlers, expectant and nursing mothers in all the various child welfare centres. The following figures give the number of beneficiaries during 1954:

Infants	Toddlers	Expectant mothers	Nursing mothers
13,985	1,52,176	39,769	65,761

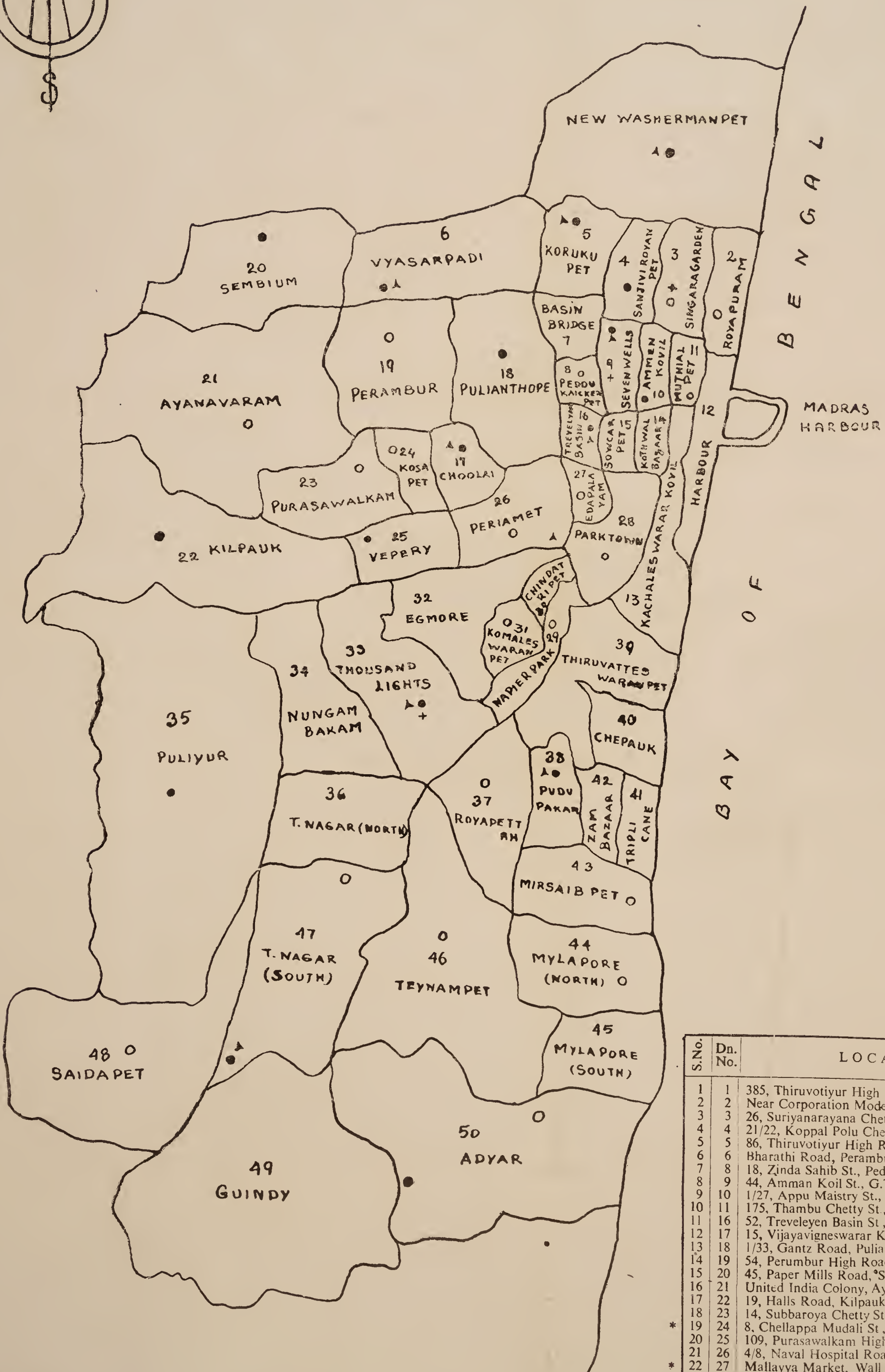
*General:*—The Corporation has a scheme for re-organisation of the child welfare work. The intention is to have 6 main centres, with 50 beds in each where maternity cases will be attended to instead of at 17 centres where beds ranging from 6 to 34 have now been provided. In divisions other than those in which the main centres are located, sub-centres will be provided where pre-natal and post-natal advice will be given and child welfare work attended to. This will enable adequate staff being provided at the main centres so that the centres may not be without a Doctor at any time of the day or night. In order to enable the Corporation to meet the cost of these expansion Schemes, Government were requested to sanction a grant of 25% of the total cost incurred on maternity and child welfare work as such a grant is now being paid by the Government to all other local bodies including municipalities. The Government have, however, turned down the request and the Council has, therefore, been forced to slow down the expansion scheme. A further representation has been made to Government in the matter and it is hoped that Government will decide to accord to the Corporation the same treatment which they are according to other municipal bodies and thus enable the Corporation Council to expand this part of its activities.

C. N. RUKMINI,  
*Lady Superintendent,*  
*Child Welfare Scheme.*





# MAP OF CITY SHOWING THE LOCATION OF CHILD WELFARE CENTRES ETC.



## REFERENCE:-

- - CHILD WELFARE CENTRE WITH MATERNITY WARD
- - CHILD WELFARE CENTRE
- ✚ - CRECHE
- ▲ - FAMILY PLANNING CLINIC

S.No.	Dn. No.	LOCATION
1	1	385, Thiruvotiyur High Road, Tondiarpet
2	2	Near Corporation Model lines, Palmyrah kuppam
3	3	26, Suriyanarayana Chetty St., Royapuram
4	4	21/22, Koppal Polu Chetty St., Washermanpet
5	5	86, Thiruvotiyur High Road, Washermanpet
6	6	Bharathi Road, Perambur
7	8	18, Zinda Sahib St., Peddunaickenpet
8	9	44, Amman Koil St., G.T.
9	10	1/27, Appu Maistry St., G.T.
10	11	175, Thambu Chetty St., G.T.
11	16	52, Treveleyen Basin St., Sowcarpet
12	17	15, Vijayavigneswarar Koil St., Choolai
13	18	1/33, Gantz Road, Pulianthope
14	19	54, Perumbur High Road, Perumbur
15	20	45, Paper Mills Road, Sembiam
16	21	United India Colony, Ayanavaram
17	22	19, Halls Road, Kilpauk
18	23	14, Subbaroya Chetty St., Nammalwarpet
* 19	24	8, Chellappa Mudali St., Kosapet
20	25	109, Purasawalkam High Road, Purasawalkam
21	26	4/8, Naval Hospital Road, Periamet
* 22	27	Mallayya Market, Wall Tax Road
23	28	2/3, Pereira St., Park Town
24	29	1/61, Arunachala Naicken St., Chintadripet
25	31	37, Langs Garden Road, Pudupet
26	33	27, Jaganathapuram, 2nd St., Chetpet
27	35	68, Arcot Road, Kodambakkam
28	37	84, Lloyds Road, Royapettah
29	38	8, Nainiappa Maistry Road, Triplicane
30	43	65, Dr. Besant Road, Triplicane
31	44	48, Bazaar Road, Mylapore
32	46	104, Mount Road (Corpn. Dispensary)
33	47	2, Jeenis Road, Saidapet,
34	47	3, Sivagnanam Road, (Corpn Dispensary)
35	48	24, Danapal Chetty St., Saidapet
36	50	34, Brodies Road, Adyar
37	50	44, Vasantha Press Road, Arunachalapuram, Adyar

(\* Centres opened during the year 1955)







## INSTITUTIONS UNDER THE DEPARTMENT

*Offices of Registration of Births and Deaths*

Serial No.	Divisions Served	Location
1	1, 2 & 3	87, Suryanarayana Chetty St., Rayapuram
2	4 & 5	546, Thiruvottiyur High Road, Washermenpet
3	6	55, Madhavaram High Road
4	7, 8, 9 & 10	244, Mint Street
5	11, 12 & 13	47, Linghi Chetty Street
6	14, 15	161, Govindappa Naicken Street
7	16	183, Walltax Road
8	17	Rotler Street, Vepery
9	18 & 19	55, Pulianthope High Road
10	20	23, Paper Mills Road, Sembiam
11	21	127, Konnur High Road, Ayanavaram
12	22-A	65, Poonamallee High Road, Near Spur Tank
13	22-B & 35-B	100 do Aminjikarai
14	23, 24 & 25	6, Gangadareswarar Koil Street, Purasawalkam
15	26	66, Maddox Street, Vepery
16	27 & 28	23, Kolandai Street, Park Town
17	29 & 30	3 61 Arunachala Naicken Street, Chintadripet
18	31 & 32	34, Poosala Gengu Reddy Street, Egmore
19	33 & 34	15, Noor Veerasami Iyer St., Nugambakkam
20	35-A	107, Arcot Road, Kodambakkam
21	36 & 47-A	3, Sivagnanam Road, T'Nagar
22	37, 38, 39 & 40	369, Pycrofts Road, Pudupakkam
23	41 & 42	25, Pycrofts Road, Triplicane
24	43	25, Barber's Bridge Road
25	44	101, Katche i Road, Mylapore
26	45 & 50-A	63, do
27	46	104, Mount Road, Teynampet
28	47-B & 48	No. 1, Karnceswaran Koil Street, Saidapet
29	49	32 5 Velacheri Road, Guindy
30	50-B	12, Bridge Road, Adyar

*Offices of Sanitary Inspectors*

Divn. No.	Location
1	21 22, Kappal Polu Chetty Street
2	1, Kalmandapam Road
3	Robinson Park
4	546, Thiruvottiyur High Road, Old Washermenpet
5	do.



Divn. No.	Location
6	Hope Lodge. Gantz Road
7	Model Cattle Yard, Basin Bridge Road
8	244, Mint Street
9	31, St. Xavier St. G. T.
10	Junction of Monegar Choultry Rd. & Ebramji Sahib St. G. T.
11	1 32, Ebramji sahib St.
12	6 7, Adam St., Harbour
13	47, Linghi Chetty Street
14	3 48, Thatha Muthiyappan Street
15	161, Govindappa Naicken St. G. T.
16	183, Wall Tax Road
17-A	39, Veda Vinayagar Road
17-B	do.
18	55, Puliantope High Road
19	1-B, Bashyam Reddy 1st Street
20 A & B	25, Paper Mills Road, Sembiam
21	127, Konnur High Road- Ayanavaram
22-A	65, Poonamallee High Road, Kilpauk
22-B	Corporation Market Shenoy Nagar
23	6, Gangadareswarar Koil Road
24	39, Vedavinayagar Road
25	65, Poonamallee High Road
26	66, Maddox St., Vepery
27	28, Wall Tax Road.
28	23, Kolandai Street
29	3A, Arunachella Naick St., Chintadripet
30	72, Kalavai Chetty St., Chintadripet
31	83, Harris Road
32	34, Poosala Gengu Reddy St., Egmore
33	16-A, Nungambakkam High Road
34	21, Village Road, Nungambakkam
35-A	107, Arcot Rd., Kodambakkam
35-B	Corporation Market, Shenoy Nagar
36	3, Sivagnanam Rd., T'Nagar
37	368 369, Pycrofts Road
38	do
39	102, Thayar Sahib Street
40	25, Pycrofts Road
41	do
42	22, Chengalroya Mudaly Street, Triplicane
43 A & B	25, Barbers Bridge Road



Divn. No.	Location
44	101, Katcheri Road, Mylapore
45	do do.
46	104, Mount Road, Teynampet
47-A	3, Sivagnanam Road
47-B	22, Brahmin St, Saidapet
48-A	do do
48 B	do do
49	32/5, Velacheri Road, Guindy
50-A	Mandavali, St., Mylapore
50-B	Bridge Road, Adyar

*Dispensaries*

Serial No	Divn. No.	Name	Location
1	1	Rayapuram Disp	87, Suryanarayana Chetty St.
2	5	Washermenpet „	85, Tiruvottiyur High Road
3	6	Vyasarpady Disp	Hope Lodge, Gantz Road
4	6	Perambur „	55, Madavaram High Road
5	8	Mint „	244, Mint street
6	11	Harbour „	6/7, Adam Street
7	14	Mafuzkhan	
		Garden „	55, Thatha Muthiappen Street
8	16	Trevelyan	
		Basin „	17, Trevelyan Basin Water Works Street
9	17	Baliah Naidu „	Rotler Street
10	20	Sembiam „	42, Paper Mills Road
11	21	Ayanavaram „	127, Konnur High Road
12	23	Kilpauk „	6, Gangadareswarar Koil St.
13	24	Kosapet „	8, Chellappa Mudali Street
14	29	Chintadripet „	2-61, Arunachala Naick Street
15	32	Egmore „	34, Poosala, Gengu Reddy St, Egmore
16	34	Nungambakkam „	15, Noore Veerasamy Iyer Street
17	35	Kodambakkam „	107, Arcot Road
18	37	Pudupakkam „	367, Pycrofts Road
19	41	Triplicane „	25, do
20	43	Krishnampet „	25, Barbers Bridge Road
21	45	Mylapore „	101, Katcheri Road
22	46	Teynampet „	104, Mount Road
23	47	T'Nagar „	3, Sivagnanam Road
24	50	Adyar „	Lattice Bridge Road
25	33	Ayurvedic „	Model School Street, Thousand Lights
26	13	Mannady Unani	47, Linghi Chetty St.
27	18	Puliantope „	55, Puliantope High Road
28	31	Pudupet „	1, Venkatachala Achari St.
29	39	Thiruvateeswaranpet	
		Unani	102, Thayar Sahib Street
30	3	Royapuram Siddha	109, Adam Sahib Street
31	17	Choolai „	16, Alathoor Subramania Achari Street
32	19	Otteri „	1-B Bashyam Reddy 1st St.
33	2	Palmyrah Kuppan	Near Corporation Model Lines



34	40	Chepauk Dispensary	Khana Bagh Street
35	11	Muthialpet	Geils Street, G. T.

*Clinics*

Venereal clinic	82 83, Strahans Road, Perambur
Leprosy clinics	Ice House Road (Beasant Road) Triplicane Hope Lodge, Vyasarpady
T. B. Clinics	Puliantope High Road Government General Hospital Government Stanley Hospital Government Royapettah Hospital Kasturba Gandhi Hospital

*Laboratories*

Public Health Clinical Laboratory, Ripon Buildings (Tel. No. 2988 50)
Public Analyst's Laboratory, Ripon Buildings (Tel. No. 2988 55)
Water Analyst's Laboratory, Kilpauk Water Works (Tel. No. 2202)
Malaria Laboratory 17, Trevelyan Basin Water Works Street

*Hospital*

Infectious Diseases Hospital Tiruvottiyur High Road, Tondiarpet (Tel. No. 3117)
Sri Tiruvotteeswar Tuberculosis Hospital 391, Konnur High Road (Tel. No. 4827)

Ashok Vihar Health & Recreation Centre, People's Park. (Tel. No. 4754)

Zoological Gardens, Peoples Park (Tel. No. 55314)

Lethal Chamber, Basin Road

Hearse:—Corporation Lorry Station (Tel. No. 3457)

*Poor Relief*

Work House for able bodied beggars	} Suryanarayana Chetty street
Poor House	
Orphanage	
Special Home for the diseased and infirm	} Krishnampet

Mid-day meals centres (Tel. No. 86377)

Basin Road-Kondithope-North Range
Iyah Mudaly Street-Chintadripet Central Range (Tel. No. 85763)
Conran Smith Road, Gopalapuram-South Range

*Veterinary Dispensaries*

Basin Road, Konditope
Barbers Bridge Road, Krishnampet
Prasanna Prasanna Vinayagar Koil St, Mylapore



## Corporation Cattle Yards

Basin Road, Kondithope  
 Singanna Chetty Street, Chintadripet  
 Vinaithirta Vinayaga Mudali Street, Kosapet  
 Venkatarangam Pillai St., Saidapet

## Slaughter Houses

## Sheep and Cattle

Gantz Road—Perambur Barracks  
 Alandur Road—Saidapet

## Pigs

Junction of Basin Rd. and Pulian-  
 thoep High Road

## CHILD WELFARE CENTRES

## S. No.

## Location

1 *Tondiarpet	385, Tiruvottiyur High Road
2 Royapuram	26, Suryanarayana Chetty St.
3 Palmyrah kuppam.	Near Corpn. Model Lines
4 *Washermenpet	86 Thiruvottiyur High Rd
5 *Sanjiviroyanpet	21 22, Kappal Polu Chetty St
6 *George Town	44, Amman Koil St.
7 Muthialpet	175, Thambu Chetty St.
8 *Kothwal Bazaar	1 27, Appu Maistry St.
9 *Trevelyan Basin	52, Trevelyan Basin St.
10 Park Town	2 3, Pereira St.
11*Choolai	15, Vijaya Vigneswarar Koil St.
12 *Sembium	45, Paper Mills Road
13 North Perambur	54 & 55, Perambur High Rd.
14 *Puliantope	1 33 Gantz Road
15 *Purasawalkam	109, Purasawalkam High Rd.
16 *Kilpauk	19, Halls Road
17 *Chetpet	27, Jaganathapuram 2nd St.
18 Egmore	37, Langs Garden Road
19 *Saidapet	Jeenis Road
20 Periamet	4 8, Naval Hospital Road
21 *Kodambakkam	68 Arcot Road
22 *Triplicane	8, Nyniappen Maistry Street
23 Mirsahibpet	65, Dr. Besant Road
24 Mylapore	48 Bazaar Road
25 Royapettah	84, Lloyds Road
26 Mandaveli	34, Brodies Road
27 *Adyar	44, Vasantha Press Road
28 Ayanavaram	7, United India Colony



S. No.	Location
29 Teynampet	.. 104, Mount Road
30 T. Nagar	.. 3, Sivagnanam Road
31 Nammalwarpet	... 14 Subbaraya Chetty St.
32 Napier Park	.. 1/61, Arunachala Naicken Street.
33 Peddunaickenpet	.. 18 Zindah Sahib St.
34 *Vyasarpadi	... Bharati Road
35 Saidapet	... 24, Dhanapal Chetty Street
36 Mallayya Market	.. Wall Tax Road
87 Kosapet	.. 8, Chellappa Mudali Street

#### CRECHES

1 Broadway	... Bunder Rama Naicken Garden
2 Royapuram	.. Child Welfare Centre
3 Chetput	.. Child Welfare Centre

#### Burial & Burning Grounds

S. No.	Dn. No.	Name of burial Ground	Location
1	1	Kasimode Burial and Burning Ground	Suryanarayana Chetty Street, Royapuram.
2	6	Melpattadai Ponnappa Mudali St. Burial and Burning Ground	Melpattadai Ponnappa Mudali Street, Perambur.
3	6	Manali Road Burial and Burning Ground	Manali Road, Vyasarpady.
4	7	Washermenpet Burial and Burning Ground	Kathiawakkam High Road, Washermenpet.
5	17	Choolai Cremation Ground	Basin Road, Puliantope.
6	20-A	Thangal Burial and Burning Ground	Thangal, Sembiam.
7	20-A	Peravallur Burial and Burning Ground	Peravallur, Sembiam.
8	20-B	Agaram Burial and Burning Ground	Loco Works Road, Sembiam.
9	21	Vailangadu Burial and Burning Ground	Iyanavaram.
10	22-B	Halls Road Burial and Burning Ground	Halls Road, Kilpauk.
11	23	Otteri Burial and Burning Ground	Brick-kiln Road, Otteri.
12	34	Sterling Road Burial and Burning Ground	Sterling Road, Chetput.
13	35-A	Puliyur Burial and Burning Ground	Puliyur Cheri Kodambakkam.
14	35-A	Saligramam Burial and Burning Ground	Near Saligramam Cheri
15	35-A	Kodambakkam Burial and Burning Ground	Kodambakkam, near AVM Studios
16	35-A	Nallankuppam Burial and Burning Ground	Nallankuppam West Mambalam.



S. No.	Dn. No.	Name of burial Ground	Location
17	35-B	Aminjikarai Burial and Burning Ground	Lime Kiln Street Aminjikarai
18	35-B	Arumbakkam Burial and Burning Ground	Aminjikarai.
19	35-B	Naduvankarai Burial and Burning Ground	do
20	35-B	Mullam Burial and Burning Ground	do
21	35-B	Periagudal Burial and Burning Ground	do
22	43	Krishnampet Burial and Burning Ground	Gajapathy Lala Street Dr. Besant Road
23	44	Mylapore Burial and Burning Ground	South of Edward Elliots Road
24	47-A	Thyagaraya N a g a r Burial and Burning Gr.	Kannammamet.
25	48-B	Saidapet Burial and Burning Ground	Jones Road, Saidapet.
26	49	Kottur Burial and Burning Ground	Kottur, Guindy.
27	49	Zamin Adyar Burial and Burning Ground	Adyar.
28	49	Kallikundram Burial and Burning Gr.	Adayar.
29	49	Velacheri Burial and Burning Ground	do
30	50-B	Urur Burial and Burning Ground	Urur Village, Adyar.
31	1	Muslim Burial Ground	Surianarayana Chetty Street.
32	„	„ Bhora Burial Gr.	do
33	„	„ Old Burial Gr.	do
34	„	„ Khoja Burial Gr.	Thandavaroya Gramany Street.
35	22-A	Kilpauk B. G.	Shenoy Nagar.
36	1	Christian Cemetery	Surianarayana Chetty Street.
37	22-A	Kilpauk Cemetery	Shenoy Nagar.
38	50	Ellapatha Mada Coil Cemetery	St. Mary's Road, Mylapore.
39	1	Chinese Burial Gr.	Surianarayana Chetty St.
40	„	Jewish Burial Gr.	do
41	22-A	Buddist Burial Gr.	Shenoy Nagar.







APPENDIX I

Months.	Mean Barometric pressure corrected for temperature and reduced to Standard gravity and mean sea level in Millibars 08·30 Hours I.S.T.	Temperature (°F)					Humidity.	Wind.	Rainfall in inches.			
		Mean maxi-mum.	Mean Mini-mum.	Mean daily Range Columns (3-4)	Mean daily tempe- rature ½ of Columns (3 + 4)	Mean dew point 08·30 Hours I.S.T.			Difference between mean temperature and Dew point temperature at 08·30 Hours I.S.T. Columns (6-7)	Total fall for the month in inches.	Heavi- est rain- fall in 24 hours in inches.	No. of Rainy Days 0·10" and over.
1	2	3	4	5	6	7	8	9	10	11	12	13
January	1013·3	83·6	69·1	14·5	76·3	68·0	8·3	78	003	1·06	0·54	3
February	1013·5	87·3	70·3	17·0	78·8	69·3	9·5	75	252	0·00	0·00	0
March	1012·3	90·0	74·2	15·8	82·1	72·4	9·7	75	236	0·00	0·00	0
April	100S·9	92·7	80·3	12·4	86·5	75·4	11·1	70	200	0·00	00·0	0
May	1004·4	97·7	82·9	14·8	90·3	73·0	17·3	61	250	0·15	0·15	1
June	1004·2	99·7	83·2	16·5	91·5	67·9	23·6	50	268	0·14	0 08	0
July	1005·1	92·1	78·2	13·9	85·1	72·3	12·8	73	241	9·01	2·69	10
August	1005·0	90·7	78·0	12·7	84·3	73·9	10·4	76	252	6 08	2·31	7
September	1006·7	92·3	78·1	14·2	85·2	70·8	14·4	68	268	3·63	1·48	7
October	1009·8	87·8	75·4	12·4	81·6	74·6	7·0	82	301	11·33	4·70	10
November	1014·5	83·8	70·5	13·3	77·1	68·8	8·3	72	002	2·33	2·23	1
December	1012·5	81·6	71·4	10·2	76·5	72·3	4·2	86	029	10·62	2·37	11
Total	12110·2	1079·3	911·6	167·7	995·3	858·7	136·6	866	...	44·35	...	50
Means	1009·2	89·9	76·0	14·0	82·9	71·6	11·4	72	...	...	...	...



## Births registered in each Division during 1954

## APPENDIX I

Division No.	Name of Division	Population according to the census of 1951			Number of Live Births Registered			Ratio of Births per 1000 of Population			Number of males born to every 100 Females born	Excess of Births over Deaths per 1000 of Population	Excess of Deaths over Births per 1000 of Population	Number of still-births Registered
		Males	Females	Total	Males	Females	Total	Males	Females	Total				
1	New Washermenpet	15,543	15,826	31,369	791	772	1,563	50.9	48.8	49.8	102.5	18.0	36	
2	Royapuram	10,117	10,734	20,851	441	462	903	43.6	43.0	43.3	95.4	21.8	16	
3	Singara Garden	24,594	18,602	43,196	1,381	1,182	2,563	56.2	63.5	59.3	116.9	35.5	115	
4	Sanjeeverayanpet	26,660	24,718	51,378	1,171	1,135	2,306	44.0	46.0	45.0	103.2	20.4	47	
5	Korukupet	16,456	20,150	36,606	1,094	1,062	2,156	66.5	52.7	59.0	103.0	19.0	60	
6	Vyasarpady	12,641	12,147	24,788	566	503	1,069	45.0	41.4	43.1	112.5	19.0	38	
7	Basin Bridge	11,472	11,272	22,744	436	447	883	38.0	40.0	39.0	97.6	16.0	31	
8	Peddu Naickenpet	16,011	15,001	31,012	506	542	1,048	31.6	36.1	33.8	93.4	15.4	29	
9	Seven Wells	14,994	11,990	26,984	575	587	1,162	38.4	49.0	43.1	98.0	12.5	33	
10	Amman Koil	12,636	10,954	23,590	437	450	887	34.6	41.1	37.6	97.1	17.6	25	
11	Muthialpet	12,894	13,297	26,191	483	467	950	37.5	35.1	36.3	103.4	20.0	27	
12	Harbour	8,950	7,021	15,971	316	283	599	35.3	40.3	37.5	111.7	11.3	11	
13	Kachaleswarar Koil	7,832	4,961	12,793	264	219	483	33.7	44.2	37.7	120.6	20.4	10	
14	Kothawal Bazaar	8,771	6,346	15,117	281	260	541	32.0	41.0	35.8	108.1	17.0	13	
15	Sowcarpet	8,782	6,489	15,271	280	244	524	31.9	37.6	34.3	114.7	18.3	15	
16	Trevelyan Basin	15,124	14,072	29,196	578	564	1,142	38.2	40.1	39.1	102.5	19.0	22	
17	Choolai	27,226	25,751	52,977	1,166	1,075	2,241	42.5	41.8	42.3	108.5	22.0	41	
18	Pulianthope	23,000	21,194	44,194	1,016	1,029	2,045	40.0	48.6	46.3	98.7	18.9	55	
19	Perambur Barracks	14,843	14,662	29,505	591	507	1,098	39.8	34.6	37.2	116.6	12.2	21	
20	Sembium	14,608	15,677	30,285	745	691	1,436	51.0	44.1	47.4	107.8	22.3	38	
21	Aynavaram	14,664	14,354	28,818	631	612	1,243	43.6	42.6	43.2	103.1	12.3	40	
22	Kilpauk	12,629	10,287	22,916	486	463	949	38.5	45.0	41.8	105.0	22.8	29	



# APPENDIX II

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23	Purasawalkam	...	16,738	14,008	30,746	525	464	989	31.4	33.1	32.2	113.1	12.0	...	16
24	Kosapet	...	20,227	19,407	39,634	895	874	1,769	44.2	45.0	44.6	102.4	20.0	...	36
25	Vepery	...	8,298	9,136	17,434	339	321	660	40.9	35.1	38.0	105.6	20.0	...	12
26	Periamet	...	16,728	14,835	31,563	527	574	1,101	31.5	39.0	35.3	91.8	15.0	...	39
27	Edapalayam	...	10,124	8,358	18,482	287	287	574	28.3	34.4	31.4	100.0	11.7	...	12
28	Park Town	...	9,160	7,075	16,235	217	200	417	23.7	28.3	26.0	108.5	...	35.2	16
29	Napier Park	...	10,682	8,876	19,558	317	367	684	30.0	41.4	35.7	86.4	16.6	...	13
30	Chintadripet	...	13,688	12,809	26,497	510	507	1,017	37.3	40.0	38.7	101.6	15.3	...	23
31	Komāleswaranpet	...	14,814	13,126	27,940	560	545	1,105	38.0	41.5	39.8	102.7	18.2	...	25
32	Egmore	...	8,385	8,319	16,704	734	655	1,389	81.5	78.8	83.2	112.1	59.6	...	106
33	Thousand Lights	...	15,997	15,345	31,342	658	686	1,344	41.1	44.7	42.9	96.0	20.5	...	31
34	Nungambakkam	...	14,739	12,668	27,407	509	503	1,012	34.5	39.7	37.0	101.2	18.3	...	29
35	Kodambakkam	...	19,226	17,908	37,134	865	827	1,692	45.0	46.2	45.6	104.6	22.5	...	46
36	Theagarayanagar (North).	...	10,886	10,487	21,373	407	396	803	37.4	38.0	37.7	103.0	19.5	...	15
37	Royapettah	...	11,901	11,443	23,344	453	414	867	38.1	36.2	37.1	109.4	18.6	...	31
38	Pudupakkam	...	14,448	14,224	28,672	577	542	1,119	40.0	38.1	39.0	106.5	14.3	...	24
39	Thiruvatteswarpet	...	15,878	14,485	30,363	650	621	1,271	41.0	42.9	42.0	104.7	15.5	...	29
40	Chepauk	...	12,818	11,449	24,267	608	625	1,233	47.5	51.6	51.0	97.3	30.0	...	53
41	Triplicane	...	14,537	12,240	26,777	495	481	976	34.1	40.0	36.5	103.0	17.0	...	16
42	Zam Bazaar	...	13,295	11,749	25,044	498	482	980	37.4	41.0	39.2	103.3	15.9	...	25
43	Mirsahibpet	...	23,307	20,873	44,180	1,086	1,021	2,107	46.6	50.0	48.3	106.4	11.7	...	37
44	Mylapore (North)	...	17,383	21,351	38,734	743	685	1,428	42.7	32.1	37.4	108.5	16.6	...	44
45	Mylapore (South)	...	13,137	12,608	25,745	430	427	857	32.7	34.0	33.4	100.7	13.5	...	18
46	Teynampet	...	17,741	15,736	33,477	696	678	1,374	39.2	43.1	41.2	102.6	21.0	...	24
47	Theagarayanagar (South).	...	18,630	16,762	35,392	761	739	1,500	40.8	44.0	42.4	103.0	21.4	...	32
48	Saidapet	...	18,093	16,373	34,466	709	656	1,355	39.2	40.0	39.6	108.1	20.7	...	26
49	Guindy	...	9,604	7,812	17,416	286	284	570	30.0	36.4	32.7	100.7	18.2	...	19
50	Adayar	...	14,550	13,548	28,098	605	657	1,262	41.6	48.5	45.0	92.1	22.8	...	24
	Fort St. George	...	1,752	528	2,280	...	...	...	...	...	...	...	...	...	...
Total		...	7,37,013	6,79,043	14,16,056	30,182	29,074	59,256	40.95	42.82	41.85	103.81	16.4	...	1573



Births registered in the divisions during each month in 1954.

## APPENDIX I

Division Number.	Name of Division.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total number of births registered.
1	New Washermenpet	84	122	127	117	111	92	107	135	141	141	198	185	1,563
2	Royapuram	44	58	66	68	59	80	67	78	83	88	99	113	903
3	Singara Garden	63	210	189	189	169	229	212	242	226	219	316	299	2,563
4	Sanjeeverayanpet	140	111	151	165	176	186	177	225	211	245	246	273	2,306
5	Korukupet	143	132	137	158	145	183	151	173	192	219	262	261	2,156
6	Vyasarpady	70	62	76	67	74	93	90	105	108	100	119	105	1,069
7	Basin Bridge	65	61	69	57	65	71	73	64	77	85	76	120	883
8	Peddu Naickenpet	71	56	72	72	69	100	89	103	87	117	112	100	1,048
9	Seven Wells	79	64	89	95	99	100	88	90	109	120	106	123	1,162
10	Ammen Koil	55	68	52	63	62	79	71	77	81	84	86	109	887
11	Muthialpet	53	55	77	71	77	81	99	65	92	77	106	97	950
12	Harbour	31	47	42	38	44	43	48	48	46	57	67	88	599
13	Kachaleswarar Coil	26	28	39	35	28	37	32	48	40	46	49	75	483
14	Kothawal Bazaar	33	36	46	24	51	46	43	51	48	58	59	46	541
15	Sowcarpet	25	32	38	47	36	32	38	38	54	74	56	54	524
16	Trevelyan Basin	56	66	58	81	66	92	81	86	134	139	130	153	1,142
17	Choolai	120	124	152	167	143	158	204	209	193	264	260	243	2,241
18	Pulianthope	110	119	160	144	134	158	139	214	184	193	244	246	2,045
19	Perambur Barracks	63	76	77	76	55	111	112	104	94	86	126	118	1,098
20	Sembium	80	60	101	110	118	132	98	161	159	118	139	160	1,436
21	Aynavaram	81	70	78	94	76	94	112	119	124	125	121	149	1,243
22	Kilpauk	61	59	57	65	58	87	78	86	103	75	100	120	949



## APPENDIX I

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23	Purasawalkam	...	62	55	61	79	68	75	77	99	86	96	116	115	989
24	Kosapet	...	91	97	122	143	119	133	146	158	186	184	197	193	1,769
25	Vepery	...	37	32	53	58	48	45	51	61	76	57	75	67	660
26	Periamet	...	62	67	102	86	73	91	92	80	117	99	115	117	1,101
27	Edapalayam	...	41	26	42	48	34	32	56	52	74	44	66	59	574
28	Park Town	...	20	21	36	28	31	36	33	41	37	46	40	48	417
29	Napier Park	...	52	46	46	56	37	62	63	50	74	56	62	80	684
30	Chintadripet	..	55	53	69	84	74	90	89	81	100	113	101	108	1,017
31	Komaleswaranpet	...	61	71	76	100	79	88	93	94	104	85	112	112	1,105
32	Egmore	...	79	69	77	104	109	115	140	144	142	125	156	129	1,389
33	Thousand Lights	...	87	88	96	89	96	108	96	119	150	117	152	146	1,341
34	Nungambakkam	...	64	50	59	59	64	89	71	87	100	109	122	138	1,012
35	Kodambakkam	...	97	94	114	126	139	145	137	168	140	160	179	193	1,692
36	Theyagarayanagar (North)	...	49	50	43	62	54	59	72	72	85	79	104	74	803
37	Royapettah	...	53	39	54	70	88	69	77	79	81	76	83	98	867
38	Pudupakkam	...	79	50	78	90	93	106	90	98	108	104	107	116	1,119
39	Thiruvatteswaranpet	...	87	78	94	98	99	108	106	115	144	103	125	114	1,271
40	Chepauk	...	81	58	90	95	91	107	112	110	115	100	142	132	1,233
41	Triplicane	...	64	59	58	65	80	68	88	82	89	90	102	124	976
42	Zam Bazaar	...	57	48	59	74	71	68	79	90	115	83	105	126	980
43	Mirsahibpet	...	127	128	108	161	156	153	177	163	194	210	227	303	2,107
44	Mylapore (North)	...	73	79	108	100	124	108	116	109	154	166	144	147	1,428
45	Mylapore (South)	...	54	52	52	59	70	53	69	67	93	99	92	97	857
46	Teynampet	...	96	85	81	103	95	111	97	128	151	101	162	164	1,374
47	Theyagarayanagar (South)	...	97	83	78	129	121	122	122	147	143	139	158	161	1,500
48	Saidapet	...	79	48	76	112	102	116	117	134	138	160	145	138	1,365
49	Guindy	...	32	25	33	40	37	53	64	53	60	52	61	57	570
50	Adyar	..	79	78	86	94	91	76	106	109	132	106	139	166	1,262
Total		...	3,468	3,445	4,004	4,415	4,261	4,770	4,849	5,318	5,774	5,694	6,499	6,759	59,256



## STATEMENT No. IV

Statement showing the Area, Density of Population, the number of Deaths registered and Deaths under one year with rates in 1954

Division No.	Name of Division	Area in Square Miles	Area in Acres	Density per Acre	Population according to the census of 1951			Number of Deaths registered (excluding still—Births)			Ratio of Deaths per 1000 of Population		Number of Deaths of Males of every 100 Female Deaths	Number of Infantile Deaths registered		
					Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
1	New Washermenpet	2.6158	1674.1120	18.7	15,543	15,826	31,369	506	492	998	32.6	31.1	31.8	115	119	234
2	Royapuram	0.4444	281.4160	73.3	10,117	10,734	20,851	221	227	448	21.8	21.2	21.5	52	55	107
3	Singara Garden	0.4430	283.5200	152.4	24,594	18,602	43,196	538	493	1,031	21.9	26.5	24.0	179	116	295
4	Sanjeeverayanpet	0.5249	335.9360	152.9	26,660	24,715	51,375	659	595	1,254	24.8	24.1	24.5	173	148	321
5	Korukupet	1.1113	711.2320	5.5	16,456	20,150	36,606	731	740	1,471	44.4	36.7	40.2	182	177	359
6	Vyasarpady	1.9180	1227.5200	20.2	12,641	12,147	24,788	287	317	604	22.7	26.9	24.3	69	65	134
7	Basin Bridge	0.3155	201.9200	101.3	11,472	11,272	22,744	284	240	524	21.8	21.3	23.0	78	53	131
8	Peddu Naickenpet	0.1393	89.1520	347.8	16,011	15,001	31,012	305	271	576	19.0	18.0	18.5	93	64	157
9	Seven Wells	0.1491	95.4240	282.8	14,994	11,990	26,984	466	358	824	31.1	30.0	30.5	82	60	142
10	Arman Koil	0.1051	67.2640	350.7	12,636	10,954	23,590	254	218	472	20.1	20.0	20.0	53	47	100
11	Muthialpet	0.1437	91.9680	284.8	12,984	13,237	26,191	212	217	429	16.5	16.3	16.4	45	48	93
12	Harbour	0.5346	342.1440	46.7	8,950	7,021	15,971	213	206	419	24.0	29.3	26.2	69	49	118
13	Kachaleswarar Coil	0.5244	335.6160	38.1	7,832	4,961	12,793	136	86	222	17.4	17.3	17.3	34	19	53
14	Kothawal Bazaar	0.1250	80.0000	188.9	8,771	6,346	15,117	151	133	284	17.2	21.0	19.1	45	35	80
15	Sowcarpet	0.1039	66.4960	230.0	8,782	6,489	15,271	134	111	245	15.3	17.1	16.2	29	32	61
16	Trevelyan Basin	0.1533	98.1120	297.6	15,124	14,072	29,196	283	305	588	18.7	21.7	20.2	79	81	160
17	Choolai	0.3600	230.1000	230.0	27,226	25,751	52,977	550	530	1,080	20.2	20.6	20.4	126	116	242
18	Pulianthope	0.8840	565.7600	78.1	23,000	21,194	44,194	616	593	1,209	26.8	28.0	27.4	192	152	344
19	Perambur Barracks	0.9050	579.2000	51.0	14,843	14,662	29,505	408	330	738	28.0	22.5	25.2	80	67	147
20	Sembium	2.0.27	1288.1280	23.5	14,608	15,677	30,285	389	370	759	26.6	23.6	25.1	101	98	199
21	Aynavaram	2.6100	1670.4000	17.7	14,464	14,354	28,818	462	426	888	32.2	30.0	31.0	106	97	203
22	Kilpauk	2.8542	1820.6880	12.6	12,629	10,287	22,916	224	203	427	17.7	20.0	18.9	62	48	110

## APPENDIX I



## APPENDIX I

23	Purasawalkam	...	0.4353	278.5920	110.4	16,738	14,008	30,746	326	297	623	19.5	21.2	20.3	109.7	91	66	157	158.2
24	Kosapet	...	0.2800	179.2000	221.2	20,227	19,407	39,634	530	447	977	26.2	23.0	24.6	118.6	150	111	261	147.5
25	Vepery	...	0.4310	275.8400	63.2	8,298	9,136	17,434	174	133	310	21.0	14.7	17.8	128.0	44	35	79	120.0
26	Periamet	...	0.5667	362.6880	87.0	16,728	14,835	31,563	340	292	632	20.3	20.0	20.1	116.4	92	73	165	150.9
27	Edapalayam	...	0.1090	69.7600	265.0	10,124	8,358	18,482	188	169	357	18.6	20.0	19.3	111.2	37	35	72	125.4
28	Park Town	...	0.3401	217.6640	74.6	9,160	7,075	16,235	663	325	988	72.4	46.0	52.2	204.0	32	39	71	170.3
29	Napier Park	...	0.3001	192.0640	101.8	10,682	8,876	19,558	186	173	359	17.4	20.0	18.7	108.0	38	56	94	137.4
30	Chintadripet	..	0.1384	88.5760	299.1	13,688	12,809	26,497	340	273	613	25.0	21.3	23.2	124.5	91	58	149	146.5
31	Komalaswaranpet	...	0.3181	203.5840	137.2	14,814	13,126	27,940	303	293	596	20.1	22.3	21.2	103.4	69	64	133	120.4
32	Egmore	...	0.7729	494.6560	33.8	8,385	8,319	16,704	181	212	393	21.6	25.5	23.5	85.4	81	68	149	107.3
33	Thousand Lights	...	1.3495	863.6800	36.3	15,997	15,345	31,342	329	372	701	20.6	24.3	22.5	88.4	81	94	175	130.2
34	Nungambakkam	...	1.3821	884.3440	31.0	14,739	12,668	27,407	246	265	511	16.7	21.0	18.9	93.0	51	57	108	106.7
35	Kodambakkam	...	4.2000	2685.0000	13.8	19,226	17,908	37,134	441	416	857	22.9	23.2	23.0	106.0	106	96	202	119.4
36	Theagarayanagar (North).	...	1.0360	663.0400	32.2	10,886	10,487	21,373	196	191	387	18.0	18.2	18.1	102.6	61	50	111	138.2
37	Royapettah	...	0.5400	345.6000	67.5	11,901	11,443	23,344	218	216	434	19.0	19.0	19.0	101.0	55	65	120	138.4
38	Pudupakkam	...	0.2238	143.2320	200.2	14,448	14,224	28,672	379	329	708	26.2	23.1	24.7	115.2	88	72	160	143.0
39	Thiruvatteswaranpet	...	1.0499	671.9360	45.2	15,878	14,482	30,363	401	399	800	25.3	27.6	26.4	101.0	101	98	199	156.6
40	Chepauk	...	0.2997	191.8080	126.5	12,818	11,449	24,267	246	263	509	19.2	23.0	21.1	93.5	87	73	160	130.0
41	Triplacane	...	0.1760	112.6400	237.7	14,537	12,240	26,777	265	261	526	18.2	21.3	19.8	101.5	67	61	128	131.2
42	Zam Bazaar	...	0.1391	89.0240	281.3	13,295	11,749	25,044	299	281	580	22.5	24.0	23.2	106.4	68	66	134	136.7
43	Mirasahibpet	..	0.7000	448.0000	98.6	23,307	20,873	44,180	852	741	1,593	36.5	35.5	36.0	115.0	215	183	398	190.0
44	Mylapore (North)	...	0.7485	479.0400	81.0	17,383	21,351	38,734	385	401	786	22.2	18.0	20.1	96.0	98	97	195	136.5
45	Mylapore (South)	...	0.4299	275.1360	93.6	13,137	12,608	25,745	235	275	510	17.9	21.9	19.9	85.5	60	63	113	131.8
46	Teynampet	...	1.3310	851.8400	39.3	17,741	15,736	33,477	355	317	672	20.0	20.1	20.0	112.0	105	89	194	141.2
47	Theagarayanagar (South).	...	1.2320	788.4800	45.0	18,630	16,762	35,392	377	364	741	20.2	21.9	21.0	103.6	99	85	184	122.7
48	Saidapet	...	2.2020	1409.2300	24.5	18,093	16,373	34,466	336	317	653	18.6	19.4	19.0	106.0	88	71	159	116.5
49	Guindy	..	5.3240	3407.3600	5.1	9,604	7,812	17,416	139	114	253	14.5	14.6	14.5	122.0	32	27	59	103.5
50	Adyar	..	4.6080	2949.1200	9.6	14,550	13,548	28,098	321	301	622	22.1	22.2	22.2	106.6	81	59	140	111.0
	Fort St. George	...	...	...	...	1,752	528	2,280	...	...	...	...	...	...	...	...	...	...	...
	Total	..	49.8453	31900.9920	50.4	7,37,013	6,79,043	14,16,056	17,280	15,901	33,181	23.4	23.4	20.78	108.7	4,302	3,757	8,059	136.00



## STATEMENT No. V

## VITAL STATISTICS

"Deaths" registered in each division during each month in 1954

## APPENDIX I

Division No.	Name of Division	January	February	March	April	May	June	July	August	September	October	November	December	Total number of deaths registered (excluding still births)
1	New Washermanpet	86	80	60	65	71	71	67	100	114	88	85	111	998
2	Royapuram	34	38	46	35	35	35	44	33	35	29	42	44	448
3	Singara Garden	75	106	90	79	73	85	50	99	97	80	97	100	1,031
4	Sanjeevirayanpet	105	104	94	83	85	93	77	121	135	101	92	164	1,254
5	Korukupet	125	124	112	98	87	112	86	159	158	130	134	146	1,471
6	Vyasarpadu	50	42	56	47	48	38	44	48	66	53	56	56	604
7	Basin Bridge	63	42	59	37	31	40	31	46	35	45	43	52	524
8	Peddu Naickenpet	50	36	50	40	51	45	35	53	60	48	52	56	576
9	Seven Wells	72	62	85	51	54	67	46	62	85	61	93	86	824
10	Ammen Koil	42	54	36	25	45	31	30	48	47	37	39	38	472
11	Muthialpet	48	43	33	37	36	21	32	36	41	27	44	31	429
12	Harbour	48	41	24	29	27	31	29	27	41	41	37	44	419
13	Kachaleswarar Coil	19	20	23	16	19	15	15	17	24	12	18	24	222
14	Kothawal Bazaar	28	26	41	21	26	17	19	16	28	21	23	18	284
15	Sowcarpet	16	24	25	26	15	22	14	16	12	25	23	27	245
16	Trevelyan Basin	37	49	57	35	53	32	39	67	62	41	52	64	588
17	Choolai	88	89	93	77	75	72	84	107	122	75	81	117	1,080
18	Pulianthope	101	90	114	75	80	87	83	136	123	65	108	147	1,209
19	Permbur Barracks	59	34	59	49	45	54	50	83	89	72	68	76	738
20	Sembium	63	73	58	63	72	53	45	71	67	72	46	76	759
21	Aynavaram	70	83	58	51	57	51	76	93	126	59	78	86	888
22	Kilpauk	38	35	38	36	33	32	24	24	44	40	44	39	427
23	Purasawalkam	55	64	55	47	40	42	46	60	56	49	55	54	623



# APPENDIX I

24	Kosapet	...	97	78	73	75	63	63	82	92	123	81	68	82	977
25	Vepery	...	32	27	35	16	18	22	29	28	26	21	26	30	310
26	Periamet	...	58	50	54	51	44	46	49	58	72	44	59	47	632
27	Edapalayam	...	27	30	33	35	27	14	27	30	29	23	39	43	357
28	Park Town	...	92	71	104	82	75	91	65	79	78	65	92	94	988
29	Napier Park	...	35	27	22	27	29	26	36	30	41	23	26	37	359
30	Chintadripet	...	46	51	35	45	47	59	42	54	57	57	57	63	613
31	Komaleswaranpet	...	41	46	42	51	63	48	54	46	60	55	37	53	596
32	Egmore	...	25	30	24	30	29	24	35	48	41	32	38	37	393
33	Thousand Lights	...	56	45	53	51	55	44	60	75	74	62	60	56	701
34	Nungambakkam	...	59	45	38	31	33	51	53	49	42	36	34	53	524
35	Kodambakkam	..	72	80	61	64	81	63	49	101	78	58	66	71	844
36	Theyagarayanaagar (North)	...	26	32	23	28	25	26	35	45	40	39	32	36	387
37	Royapetiah	...	36	41	40	37	28	28	28	35	51	34	45	31	434
38	Pudupakkam	...	55	48	66	54	50	57	45	66	78	61	62	66	708
39	Thiruvatteswaranpet	...	73	54	55	70	67	56	77	93	72	53	72	58	800
40	Chepauk	...	34	44	41	33	34	45	34	55	40	49	42	58	509
41	Triplicane	...	22	46	40	43	39	36	23	55	56	54	49	63	526
42	Zam Bazaar	...	52	54	68	35	45	42	33	52	51	40	39	69	580
43	Mirsaibipet	...	155	162	152	109	90	107	114	156	154	103	114	177	1,593
44	Mylapore (North)	...	50	70	81	61	68	57	56	76	82	45	63	77	786
45	Mylapore (South)	...	54	47	47	42	47	36	36	43	55	34	32	37	510
46	Teynampet	...	49	53	68	47	56	56	64	69	55	46	49	60	672
47	Theagaraya nagar (South)	...	61	54	58	58	69	46	57	80	75	49	74	60	741
48	Saidapet	...	46	37	60	49	56	58	58	69	58	54	40	68	653
49	Guindy	...	24	21	31	23	17	22	14	14	28	9	24	26	253
50	Adyar	...	44	61	53	62	48	39	41	61	67	47	51	48	622
Total		....	2,793	2,773	2,823	2,431	2,459	2,408	2,362	3,181	3,350	2,545	2,800	3,256	33,181



## Deaths registered according to ages and sex in each Division in 1954

Division No.	Name of Division	Under one year of age		One year and under Five years		Five years and under Ten years		Ten years and under Fifteen years		Fifteen years and under Twenty years		Twenty years and under Thirty years		Thirty years and under Forty years		Forty years and under Fifty years		Fifty years and under Sixty years		Sixty years and above		Total.	
		Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
1	New Washermenpet	115	119	144	159	19	23	8	7	9	36	29	35	27	41	22	37	16	64	80	506	492	998
2	Royapuram	52	55	56	65	9	8	2	3	4	16	15	13	12	14	10	23	14	33	43	221	227	448
3	Singara Garden	179	116	137	128	23	17	9	7	17	20	42	30	40	27	19	38	30	68	79	538	493	1031
4	Sanjeeverayanpet	173	148	162	184	31	25	6	8	12	32	44	31	31	53	26	53	35	110	78	659	595	1254
5	Korukupet	182	177	218	208	37	42	11	10	17	40	53	41	44	59	44	52	35	81	105	731	740	1471
6	Vyasarpady	69	65	86	92	11	11	2	6	5	15	23	16	8	19	20	13	26	30	62	287	317	604
7	Basin Bridge	78	53	71	58	8	18	5	7	8	17	22	15	12	28	11	18	18	37	35	284	240	524
8	Peddu Naickenpet	93	64	77	53	11	17	4	4	6	14	17	11	17	18	16	20	19	53	57	305	271	576
9	Seven Wells	82	60	56	60	28	18	18	19	14	45	44	43	24	42	25	63	23	69	74	466	353	824
10	Amman Koil	53	47	51	35	10	11	4	5	7	20	19	11	13	20	16	25	18	55	43	254	218	472
11	Muthialpet	45	48	48	57	11	10	6	1	4	8	14	13	16	16	11	22	10	42	40	212	217	429
12	Harbour	69	49	47	62	7	8	4	3	6	7	23	15	14	21	13	14	10	26	18	213	206	419
13	Kachaleswarar Coil	34	19	24	21	4	3	4	2	...	12	6	9	9	11	4	13	8	23	15	136	86	222
14	Kothawal Bazaar	45	35	19	32	3	5	3	3	...	14	13	11	12	7	8	14	4	32	22	151	133	284
15	Sowcarpet	29	32	10	14	8	4	1	3	3	4	5	12	4	18	8	19	12	30	27	134	111	245
16	Trevelyan Basin	79	81	65	71	12	12	5	2	6	15	16	19	12	13	17	31	18	42	66	283	305	588
17	Choolai	126	116	128	148	17	19	11	14	14	26	43	42	27	39	25	43	23	104	103	550	530	1080
18	Pulianthope	192	152	171	174	21	21	15	13	15	34	49	25	26	35	32	38	31	82	84	616	593	1209
19	Perambur Barracks	80	67	80	81	16	11	9	4	6	25	27	30	16	42	16	44	27	78	73	408	330	738
20	Sembium	101	98	91	82	17	28	6	10	9	17	18	10	14	18	23	40	28	79	72	389	370	759



## APPENDIX I

21	Aynavaram	106	97	90	120	16	17	10	7	2	4	42	29	32	23	40	26	49	26	75	77	462	426	883
22	Kilpauk	62	48	49	56	8	3	1	4	7	5	15	11	18	22	20	7	14	15	30	32	224	203	427
23	Purasawalkkam	91	66	77	81	16	11	6	4	3	7	20	18	22	10	3	26	23	8	45	56	326	29	623
24	Kosapet	150	111	124	115	22	19	8	5	7	10	25	31	22	30	37	24	50	25	85	77	530	447	977
25	Vepery	44	35	26	27	8	4	2	3	3	8	9	6	13	13	23	11	18	7	28	22	174	136	310
26	Periamet	92	73	72	76	13	13	5	6	4	11	14	22	17	19	24	14	43	14	56	44	340	292	632
27	Edapalayam	37	35	33	45	8	8	2	2	4	3	11	9	12	6	23	13	20	15	38	33	188	169	357
28	Park Town	32	39	58	52	32	23	21	8	35	15	121	48	105	40	96	29	77	27	86	44	663	325	988
29	Napier Park	38	56	48	26	7	6	...	3	2	7	7	13	12	14	15	3	18	7	39	38	186	173	359
30	Clintadripet	91	58	81	72	9	9	2	6	7	9	17	21	15	20	18	14	32	15	68	49	340	273	613
31	Komaleswaranpet	69	64	73	67	12	14	2	4	3	8	13	21	23	19	14	16	33	22	61	58	303	293	596
32	Egmore	81	68	33	33	5	7	...	2	...	8	4	25	7	19	9	10	14	15	28	25	181	212	393
33	Thousand Lights	81	94	82	111	15	18	9	1	7	5	13	23	11	20	29	20	24	18	58	62	329	372	701
34	Nungambakkam	51	57	58	79	6	12	3	10	3	3	13	13	11	7	16	14	21	10	64	60	246	265	511
35	Kodambakkam	106	96	124	121	19	18	5	8	5	6	20	25	19	22	23	18	38	19	82	83	441	416	857
36	Theagarayanagar (North)	61	50	42	49	9	10	3	...	1	7	3	11	14	12	10	10	16	15	37	27	196	191	387
37	Royapettah	55	65	44	53	3	4	4	...	6	7	16	18	13	7	18	11	23	9	36	42	218	216	434
38	Pudupakkam	88	72	78	83	18	21	9	4	4	12	21	21	33	18	19	13	37	22	72	63	379	329	708
39	Thiruvatteswaranpet	101	98	104	105	13	23	3	3	7	8	22	23	28	31	34	20	34	23	55	65	401	399	800
40	Chepauk	87	73	36	44	9	14	3	4	4	10	13	27	13	20	19	16	28	18	34	37	246	263	509
41	Triplicane	67	61	71	75	25	16	1	3	2	3	13	10	14	19	9	8	18	16	45	50	265	261	526
42	Zam Bazaar	68	66	62	64	15	9	7	4	3	13	23	15	18	12	23	13	24	14	56	71	299	281	580
43	Mirsahibpet	215	183	235	222	54	34	12	12	15	16	43	55	61	34	53	24	62	45	102	116	852	741	1,593
44	Mylapore (North)	98	97	104	123	17	20	8	3	7	10	12	19	26	28	23	16	30	20	60	65	385	401	786
45	Mylapore (South)	50	63	58	69	9	19	1	4	5	2	10	13	10	14	16	11	24	25	52	55	235	275	510
46	Teynampet	105	89	75	77	15	19	7	4	5	9	14	24	20	14	29	16	26	10	59	55	355	317	672
47	Theagaraya Nagar (South)	99	85	99	99	14	20	6	10	8	9	18	27	17	11	20	22	38	15	58	66	377	364	741
48	Saidapet	83	71	87	86	16	11	7	5	5	6	16	23	20	17	15	14	23	22	59	62	336	317	653
49	Guindy	32	27	25	28	4	3	2	1	3	1	7	12	6	8	10	6	22	8	28	20	139	114	253
50	Adyar	81	59	83	102	14	11	10	9	6	4	16	7	13	17	22	12	23	15	53	65	321	301	622
Total		4,302	3,757	3,972	4,144	734	722	282	271	304	388	1,009	1,142	1,077	924	1,271	823	1,622	935	280	2,795	17,280	1,5901	33,181
Grand Total		8,059	8,116	1,456	553	692	2,151	2,001	2,094	2,457	5,602	3,3181	...											



Deaths from principal causes registered in the divisions during 1954

## APPENDIX I

Division No.	Name of Division	Plague	Cholera	Small-pox	Measles	Enteric Fever	Malaria	Other Fevers	Dysentery	Diarrhoea	Tubercle including of Lungs	General Respiratory Diseases	Injuries	Maternal Deaths	All other causes	Total Deaths registered excluding still births
1	Naw Washermanpet	...	*3}	*28}	*1}	10	4	127	104	63	9	235	14	6	384	998
2	Royapuram	...	...	8}	2}	2	5	79	49	27	5	94	5	1	178	448
3	Singara garden	...	...	3}	...	4	11	176	88	62	6	210	6	25	438	1,031
4	Sanjeevarayanpet	...	...	11}	...	5	5	127	108	89	12	336	19	6	536	1,254
5	Korukupet	...	...	2}	...	6	6	166	123	132	8	362	19	10	637	1,471
6	Vya-arpadi	...	...	...	...	4	2	61	44	22	1	147	13	1	309	604
7	Basin Bridge	...	...	1}	...	6	2	96	35	66	3	165	3	3	144	524
8	Peddu Naickenpet	...	...	4}	...	1	2	61	34	53	9	171	8	...	233	576
9	Seven Wells	...	...	1}	...	*9}	2	95	31	45	24	292	19	4	395	824
10	Amman Koil	...	...	2}	...	7}	...	76	22	30	8	137	4	3	183	472
11	Muthialpet	...	...	2}	...	5	4	55	21	24	14	87	3	1	213	429
12	Harbour	...	...	1}	...	3	5	62	42	37	6	116	2	...	145	419
13	Katchaleswarar Koil	...	...	...	...	2	3	21	13	16	4	53	4	...	106	222
14	Kothawal Bazaar	...	...	1}	...	1	2	25	14	19	3	76	5	2	136	284
15	Sowcarpet	...	...	1}	...	...	3	26	4	14	5	35	4	2	151	245
16	Trevelyan Basin	...	...	...	...	6	4	94	55	34	5	138	3	1	248	588
17	Choolai	...	...	5}	...	5	2	130	75	57	18	307	17	7	457	1,080
18	Pulianthope	...	...	2}	...	7	2	204	95	109	20	300	11	9	450	1,209
19	Perambur Barracks	...	...	1}	...	6	4	111	72	58	14	190	17	4	261	738
20	Sembium	...	1}	...	...	4	...	77	41	83	7	181	7	2	356	759



No.	Name	Males	Females	Total	Rate per 1000 population
21	Aynavaram	67	2	69	888
22	Kilpauk	46	...	46	427
23	Purasawalkam	65	...	65	623
24	Kosapet	87	1	88	977
25	Vepery	31	2	33	310
26	Periamet	38	1	39	632
27	Edappalayam	35	3	38	357
28	Park Town	41	7	48	988
29	Napier Park	24	1	25	359
30	Chintadripet	44	...	44	613
31	Komaleswaranpet	32	1	33	596
32	Egmore	12	...	12	393
33	Thousand Lights	20	2	22	701
34	Nungambakkam	10	...	10	511
35	Kodambakkam	43	1	44	857
36	Theagarayanagar (North)	27	1	28	387
37	Royapettah	33	...	33	434
38	Puddupakkam	65	1	66	708
39	Thiruvatteswaranpet	74	1	75	800
40	Chepaik	40	2	42	509
41	Triplicane	24	3	27	526
42	Zam Bazaar	54	...	54	580
43	Mirsabipet	179	1	180	1,593
44	Mylapore (North)	47	...	47	786
45	Mylapore (South)	21	5	26	510
46	Teynampet	16	...	16	672
47	Theagaroyanagar (South)	27	...	27	741
48	Saidapet	27	1	28	653
49	Guindy	2	...	2	253
50	Adyar	15	1	16	622
Total		3,115	105	3,220	33,181
Death rate per 1000 of Estimated mid year population		234	0.15	0.003	2078







VITAL STATISTICS

STATEMENT No. IX

Births, Deaths and Infantile Deaths with rates for principal communities in 1954 compared with 1953

Community	Population according to the census of 1951	1954						1953					
		Births			Deaths			Births			Deaths		
		Total number of registered excluding still Births	Birth rate	Total number of Deaths registered excluding still Births	Death rate	Total number of Infantile Deaths registered	Infantile Death rate	Total number of Births registered excluding still Births	Birth rate	Total number of Deaths registered excluding still Births	Death rate	Total number of Infantile Deaths registered	Infantile Death rate
Aliens ...	1,534	23	15.00	14	9.13	2	87.00	23	15.00	10	6.52	1	43.50
Anglo-Indians ...	13,247	270	20.38	133	10.04	10	37.04	297	22.42	212	16.00	33	111.11
Indian Christians ...	95,387	2,565	27.00	1,534	16.08	314	122.42	2,450	25.68	1,906	20.000	350	142.90
Muslims ...	140,319	4,796	34.18	3,554	25.33	944	197.00	4,495	32.03	4,557	32.48	1,031	229.40
Hindus ...	11,55,722	51,572	44.62	27,941	24.20	6,789	131.64	47,000	40.67	37,060	32.07	8,370	178.10
Others ...	9,847	30	3.15	5	0.5	...	...	12	1.22	8	0.81	...	...
Total ...	14,16,056	59,256	41.85	33,181	23.43	8,059	136.00	54,277	38.33	43,753	30.90	9,785	180.28



## Infantile Deaths among Principal communities in 1954

Community	Under seven days		Seven days and under one month		One month and under six months		Six months and under one year		Total		Total of males and Females
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	
Aliens	...	1	...	...	...	...	...	1	...	2	2
Anglo-Indians	1	...	1	...	1	2	3	2	6	4	10
Indian-Christians	36	28	18	12	50	54	60	56	164	150	314
Muslims	99	65	59	35	213	184	148	141	519	425	944
Hindus	1,005	770	518	433	1,083	1,002	1,007	971	3,613	3,175	6,789
Others	...	...	...	...	...	...	...	...	...	...	...
Total	1,141	864	596	480	1,347	1,242	1,218	1,171	4,302	3,757	8,059



## Deaths among Infants from Principal causes by age periods in 1954.

Age periods	Cholera		Small pox		Measles		Diphtheria		Enteric Fever		Malaria		Fevers		Dysentery		Diarhoea		Infantile Debility and Malformations including premature birth		Diseases of the Respiratory system		Convulsions		Other causes		Total Infant deaths	
	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates	Deaths	Rates
Under one week	...	...	...	...	...	...	...	...	...	...	...	...	11	0.55	..	..	22	1.10	1461	72.87	234	11.67	79	3.94	198	9.87	2,005	24.88
One week and under one month	...	...	3	0.28	...	...	...	...	...	...	...	...	12	1.12	1	0.09	41	3.81	792	73.61	132	12.27	54	5.01	41	3.81	1,076	13.35
One month and under six months	...	...	17	0.66	...	...	2	0.08	...	...	...	...	148	5.72	71	2.74	307	11.86	420	16.22	970	37.47	191	7.37	463	7.88	2,589	32.13
Six months and under one year	...	...	20	0.84	...	...	20	0.84	3	0.13	1	0.04	176	7.37	191	7.90	375	15.70	69	2.90	992	41.52	90	3.76	452	19.00	2,389	29.64
Total	...	...	40	0.49	...	...	22	0.27	3	0.04	1	0.01	347	4.30	263	3.26	745	9.25	2,742	34.03	2,328	28.89	414	5.14	1,154	14.32	8,059	100.00



Infantile Deaths from Principal causes by months in 1954

APPENDIX I

Months	Cholera	Smallpox	Measles	Diphtheria	Enteric Fever	Malaria	Other Fevers	Dysentery	Diarrhoea	Infantile debility and Malformation including Premature Birth	Diseases of the Respiratory system	Convulsions	Other causes	Total Infantile Deaths in 1954	Total Infantile Deaths in 1953
January	...	4	...	3	1	...	34	20	6	221	153	34	88	564	938
February	...	4	...	1	..	..	18	15	36	196	149	45	78	542	791
March	...	8	...	3	1	...	17	9	35	191	204	37	75	580	657
April	...	5	...	..	1	...	10	22	47	135	142	34	121	517	581
May	...	2	...	1	...	...	23	16	53	189	191	42	103	620	713
June	...	5	...	1	...	...	46	16	74	159	194	36	98	629	807
July	...	1	...	..	...	...	30	23	85	210	199	25	129	702	921
August	...	2	...	4	...	...	44	34	105	278	226	23	142	858	917
September	...	...	...	3	...	...	45	48	94	290	255	29	106	870	845
October	...	3	...	3	...	...	30	15	57	210	180	27	49	574	809
November	...	4	...	1	...	1	22	18	63	284	196	34	79	702	852
December	...	2	...	2	...	...	28	27	90	359	239	47	107	901	954
Total	...	40	...	22	3	1	347	263	745	2,722	2,328	413	1,175	8,059	9,785



Deaths registered from Principal causes with rates in 1954 compared with the previous Five Years

Year	Plague		Cholera		Small pox		Measles		Enteric Fever		Malaria		Other Fevers		Dysentery		Diarrhoea		Tubercle including Tubercle of lungs		General Respiratory diseases		Injuries		Maternal Deaths		All other causes		Total Deaths	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
1949	....	48	0.05	181	0.18	..	..	192	0.19	37	0.04	2,192	2.20	1,674	1.68	1,546	1.55	700	0.70	8,072	8.09	291	0.29	130	0.13	17,576	17.62	32,639	32.71	
1950	... ..	214	0.21	945	0.93	..	..	230	0.23	102	0.10	2,644	2.61	2,226	2.20	2,109	2.08	813	0.80	8,918	8.80	325	0.32	113	0.11	20,087	19.83	38,726	38.23	
1951	... ..	216	0.15	490	0.34	2	0.001	256	0.18	91	0.06	3,504	2.44	3,461	2.41	2,234	1.56	898	6.63	9,933	6.93	443	0.31	151	0.10	20,360	14.20	42,039	29.31	
1952	... ..	182	0.12	127	0.09	6	0.004	276	0.19	75	0.05	3,823	2.57	3,949	2.65	2,665	1.79	627	0.42	10,137	6.81	536	0.36	155	0.10	20,649	13.88	43,207	29.03	
1253	... ..	709	0.46	98	0.06	..	..	215	0.14	96	0.06	4,684	3.04	3,698	2.40	2,493	1.62	471	0.31	10,010	6.50	525	0.34	155	0.10	20,599	13.36	43,753	28.37	
Mean of the previous five years.	... ..	274	0.20	368	0.32	2	0.001	234	0.19	80	0.12	3,369	2.57	3,002	2.27	2,209	1.72	702	0.57	9,414	7.43	424	0.32	141	0.11	19,854	15.78	40,073	31.53	
1954	... ..	7	0.004	305	0.20	5	0.003	234	0.15	105	0.07	3,115	2.00	2,642	1.70	1,892	1.19	403	0.25	8,198	5.14	488	0.31	150	0.10	15,637	9.80	33,181	20.78	



## VITAL STATISTICS

Births, Deaths, Infantile Deaths and the principal causes of deaths registered with rates during 1954 and in previous ten years

Year	Births		Deaths		Still Births		Infantile Deaths		Plague		Cholera		Small pox		Measles		Enteric		Malaria		Other Fevers		Dysentery		Diarrhoea		Tubercle including Tubercle of Lungs		General Respiratory Diseases		Injuries		Maternal Deaths		All other causes	
	Births	Rate	Deaths	Rate	Still Births	Rate	Infant Deaths	Infant Death Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
1944	26,056	31.74	29,705	36.19	1,062	39.2	7,407	284.27	...	...	53	0.07	144	0.18	1	0.001	86	0.11	82	0.10	2,687	3.27	2,213	2.70	1,285	1.56	290	0.35	7,166	8.73	202	0.24	178	6.83	15,318	18.66
1945	30,549	36.63	27,277	32.71	1,107	36.2	6,532	213.82	...	...	30	0.04	233	0.28	2	0.002	126	0.15	46	0.06	2,963	3.55	1,838	2.20	1,165	1.40	410	0.49	6,009	7.21	313	0.39	155	5.07	13,987	16.77
1946	41,874	43.91	27,381	28.71	1,505	35.9	7,663	183.00	...	...	1	0.001	184	0.19	...	...	107	0.11	45	0.05	2,746	2.88	1,627	1.71	1,383	1.45	405	0.42	5,878	6.16	291	0.31	140	3.56	14,565	15.27
1947	40,753	42.08	29,979	30.96	1,408	34.6	7,987	195.99	1	0.001	2	0.002	20	0.02	...	...	163	0.17	55	0.06	2,862	2.96	2,048	2.11	1,799	1.86	502	0.52	6,803	7.03	396	0.41	159	3.90	15,169	15.66
1948	50,222	51.09	31,002	31.54	1,549	30.8	7,833	155.97	...	...	210	0.21	12	0.01	...	...	143	0.15	40	0.04	2,657	2.70	1,472	1.49	1,640	1.68	621	0.63	7,237	7.36	343	0.35	142	2.83	16,485	16.77
1949	52,362	52.48	32,639	32.71	1,783	33.1	8,304	158.59	...	...	48	0.15	181	0.18	...	...	192	0.19	37	0.04	2,192	2.20	1,674	1.68	1,546	1.55	700	0.70	8,072	8.09	291	0.29	130	2.48	17,576	17.62
1950	52,619	51.94	38,726	38.23	1,449	27.5	9,878	187.73	...	...	214	0.21	945	0.93	...	...	230	0.23	102	0.10	2,644	2.61	2,226	2.20	2,109	2.08	813	0.80	8,918	8.80	325	0.32	113	2.15	20,087	19.83
1951	58,961	41.11	42,039	29.31	1,634	27.7	9,821	166.37	...	...	216	0.15	490	0.84	2	0.001	256	0.18	91	0.06	3,504	2.44	3,461	2.41	2,234	1.56	898	0.63	9,933	6.93	443	0.31	151	2.56	20,360	14.20
1952	62,921	42.28	43,207	29.03	1,612	25.6	10,308	163.82	...	...	182	0.12	127	0.09	6	0.004	276	0.19	75	0.05	3,823	2.57	3,949	2.65	2,665	1.79	627	0.42	10,137	6.81	536	0.36	155	2.46	20,649	13.88
1953	54,277	35.20	43,753	28.37	1,406	23.3	9,785	180.28	...	...	709	0.46	98	0.06	...	...	215	0.14	96	0.36	4,684	3.04	3,698	2.40	2,493	1.62	471	0.31	10,010	6.50	525	0.34	155	2.78	20,599	13.36
1954	59,256	37.12	33,181	20.78	1,573	25.9	8,059	136.00	...	...	7	0.004	305	0.20	5	0.003	234	0.15	105	0.07	3,115	2.00	2,642	1.70	1,892	1.19	403	0.25	8,198	5.14	448	0.31	150	2.47	15,637	9.80



Detailed return of deaths in the City of Madras during the year 1954

Age at the time of death	Infectious diseases									Fevers					Respiratory diseases	Alimentary diseases	Diseases of the Liver	Circulatory System	Genito-urinary diseases excluding pueral diseases	Venereal diseases	Diseases of the Nervous System	Accidents of pregnancy and childbirth	Deficiency diseases	Malignant diseases			Ankylostomiasis	Diabetes	Leprosy	Alcoholism	Congenital debility and malformation, Premature birth	Rabies	Wounds and accidents	Snake-bite, Scorpion Sting etc. Killed by wild beasts	Suicides	Poisons	Old age	All other causes	Total deaths from all causes																					
	Cholera	Plague	Small-pox	Measles	Chicken-pox	Typhoid or Enteric fever	Diphtheria	Others	Malaria	Influenza	Relapsing Fever	Kala-Azar	Rheumatic Fever	Other Fevers										Tuberculosis of Lungs	Pneumonia	Others														Dysentery	Diarrhoea	Others	Cirrhosis	Others	Heart diseases	Arterio Sclerosis	Others	Bright's disease	Others	Syphilis	Gonorrhoea	Others	Convulsions	Cerebral haemorrhage (apoplexy)	Tetanus	Epilepsy	Others	Puerperal sepsis	Abortion	Other accidents and diseases of pregnancy and parturition
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
Under one year	Under one week	...	...	...	...	...	...	...	...	...	...	...	...	11	...	18	216	...	18	4	3	9	9	...	15	...	1	6	...	1	38	9	10	...	22	...	...	...	...	...	...	...	...	1461	...	3	...	...	...	...	...	...	148	2005						
	Over one week and not exceeding one month	...	...	3	...	...	...	...	...	...	...	...	...	12	...	19	113	1	36	5	1	2	1	...	6	...	3	2	...	...	40	...	8	...	6	...	...	...	...	...	...	...	792	...	...	...	...	...	...	...	...	16	1076							
	Over one month and not exceeding 6 months	...	...	17	...	...	...	2	1	...	...	...	...	148	...	233	737	71	278	29	7	8	1	...	6	2	4	1	...	...	161	...	...	...	30	...	...	...	2	32	125	2	...	...	...	...	420	...	2	1	...	...	...	...	269	2589				
	Over 6 months and not exceeding 12 months	...	...	20	...	...	3	20	...	1	...	...	...	...	176	...	221	771	191	340	35	20	10	3	...	16	2	3	...	...	...	62	...	3	...	25	...	...	...	...	72	92	1	1	...	1	...	...	69	1	6	1	...	...	...	...	223	2389		
Total under one year	...	...	40	...	...	3	22	1	1	...	...	...	...	347	...	491	1837	263	672	73	31	29	14	...	43	4	11	9	...	1	301	9	21	...	83	...	...	...	2	106	227	4	1	...	1	...	...	...	2742	1	11	2	...	...	...	...	656	8059		
One year & under 5 years	...	3	...	85	5	...	15	58	3	11	1	...	2	...	243	26	718	1998	1241	240	23	351	63	9	1	33	16	78	...	...	1	157	...	15	...	85	...	...	...	1	236	174	3	2	...	6	1	...	...	22	3	13	4	...	2	...	1468	8116		
5 years & under 10 years	...	2	...	41	...	...	25	12	...	4	2	...	3	1	273	24	129	287	202	67	30	57	24	8	...	20	12	35	...	...	...	23	...	17	...	28	...	...	...	1	13	26	...	1	...	...	...	...	5	30	4	...	1	...	49	1456				
10 years & under 15 years	...	...	...	8	...	...	33	1	...	8	1	...	2	...	119	27	41	62	59	9	12	11	6	17	...	24	5	14	...	...	...	3	...	5	3	19	...	...	...	...	1	7	1	...	...	1	...	...	4	...	4	30	4	...	1	1	...	10	553	
15 years & under 20 years	...	...	...	30	...	...	40	1	...	12	...	...	4	1	118	35	58	97	41	16	18	4	4	33	2	27	2	14	...	...	...	2	1	10	5	20	1	2	21	...	1	3	1	1	...	3	...	1	...	1	33	...	21	3	...	5	692			
20 years & under 30 years	...	1	...	49	...	...	60	...	1	26	...	...	9	2	272	90	139	477	133	51	73	24	24	74	...	104	13	32	1	...	1	5	2	24	2	50	17	11	42	...	...	11	5	5	...	16	1	4	7	...	...	1	91	1	...	37	11	...	152	2151
30 years & under 40 years	...	...	...	32	...	...	33	...	...	15	...	...	9	...	216	85	97	398	180	50	74	38	15	84	1	123	11	44	1	1	1	1	9	14	2	44	8	4	38	...	...	16	10	9	3	13	...	4	16	...	...	2	50	1	...	18	5	...	226	2001
40 years & under 50 years	...	1	...	12	...	...	17	1	1	16	...	...	3	2	246	56	83	443	173	64	85	41	20	85	2	138	29	72	...	...	...	...	14	10	4	49	1	2	2	1	1	18	18	10	3	26	1	11	10	...	...	2	26	2	...	9	2	...	282	2094
50 years & under 60 years	...	...	...	8	...	...	7	...	1	8	...	...	2	3	294	42	99	374	176	87	80	31	23	168	5	212	29	91	...	...	2	5	15	5	4	93	...	...	1	...	...	34	17	16	2	15	...	16	14	...	...	1	22	...	...	7	...	15	433	2457
60 years & upwards	...	...	...	...	...	1	1	...	4	...	...	...	...	240	18	126	244	174	91	77	10	12	228	5	298	17	113	...	...	...	3	24	4	1	135	...	...	...	1	...	139	7	3	...	6	...	22	5	...	...	39	...	...	5	2	2674	873	5602		
Total	...	7	...	305	5	...	234	96	7	105	4	...	34	9	3068	403	1981	6217	2642	1347	545	598	220	720	16	1022	138	504	11	1	6	500	74	125	21	606	27	19	104	6	358	655	66	48	8	87	3	57	57	...	2764	20	345	18	...	98	27	2689	4154	33181







Statement showing the number of live births by age of mother and order of live birth registered in the city of Madras during the year 1954

H-6

Age of Mother at Birth	Order of Confinement of Live births															Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 and above		Not de- fined
Under 15 years	140	25	...	...	...	...	...	...	...	...	...	...	...	...	...	1	166
15-20 years	6,032	2,517	770	234	45	8	...	...	...	...	...	...	...	...	...	12	9 618
20-25 "	4,312	5,525	4,395	2,547	1,080	317	95	22	7	4	...	...	...	...	...	13	18,317
25-30 "	1,150	2,383	3,764	3,482	2,785	1,664	759	346	133	21	9	1	1	1	...	...	16,519
30-35 "	308	538	908	1,362	1,468	1,569	1,229	730	390	199	59	11	7	6	3	20	8,794
35-40 "	53	124	230	404	465	545	573	548	390	231	129	50	20	5	6	7	3,778
40-45 "	13	25	35	58	89	178	157	141	149	70	63	30	8	12	12	5	1,040
45 "	6	12	17	25	32	25	37	29	58	27	28	37	11	8	3	...	355
46 "	2	14	14	15	14	12	4	29	5	35	32	31	16	16	11	...	250
47 "	...	...	...	3	...	4	9	1	20	...	32	17	26	5	12	...	129
48 "	...	4	5	15	6	...	13	7	...	20	12	11	9	16	4	...	122
49 "	..	..	...	...	1	...	...	...	3	1	5	3	10	1	8	...	32
50 years and above	1	...	...	...	...	...	...	...	...	2	...	2	2	1	3	...	11
Not stated	24	12	11	9	12	10	3	2	5	2	1	...	...	...	...	34	125
Total	12,041	11,179	10,149	8,154	5,997	4,332	2,879	1,855	1,160	612	370	193	110	71	62	92	59,256



## STATEMENT No. I

## VACCINATION

Particulars of Vaccinations Performed in each division during 1954

Division No.	Name of Division	Population according to the census of 1951	Total Number of Persons Vaccinated			Primary Vaccination										Revaecination				Percentage of successful cases in which the results were known			
			Males	Females	Total	Total			Successful							Total			Result				
						Males	Females	Total	Under One year	One year and under 5 years	5 years and under 10 years	10 years & above	Total	Unknown	Males	Females	Total	Success-ful	Failure		Absent	Primary	Revaecination
1	New Washermenpet	31,369	5,019	5,309	10,328	578	547	1,125	718	327	5	1,096	4,762	9,203	275	6,987	1,941	99.8	3.8				
2	Royapuram	20,851	2,874	3,404	6,278	312	298	610	460	119	16	596	3,106	5,668	283	4,210	11,75	99.5	6.3				
3	Singara Garden	43,196	5,141	5,187	10,328	770	727	1,497	1,109	339	36	1,486	4,460	8,831	359	7,058	1,414	99.7	4.8				
4	Sanjeevirayanpet	51,378	5,951	6,477	12,428	923	955	1,878	1,478	367	33	1,878	5,522	10,550	193	7,456	2,901	100.0	2.5				
5	Korukupet	36,606	5,334	5,759	11,093	831	806	1,637	1,304	298	35	1,637	4,953	9,456	168	6,004	3,284	100.0	2.7				
6	Vyasarpady	24,788	2,773	2,521	5,294	499	437	936	712	199	8	919	2,084	4,358	175	2,601	1,582	98.6	6.3				
7	Basin Bridge	22,744	2,971	2,568	5,539	407	403	810	562	231	17	810	2,165	4,729	105	3,706	918	100.0	2.7				
8	Peddu Naickenpet	31,012	3,339	3,412	6,751	428	456	884	736	142	6	884	2,956	5,867	95	4,625	1,147	100.0	2.0				
9	Seven Wells	26,984	3,267	3,625	6,892	480	477	957	776	173	8	957	3,148	5,935	353	4,586	996	100.0	7.2				
10	Ammen Koil	23,590	3,539	3,817	7,356	392	388	780	638	140	2	780	3,429	6,576	215	5,115	1,246	100.0	4.0				
11	Muthialpet	26,191	3,690	2,600	6,290	432	476	908	690	212	6	908	2,124	5,382	625	3,555	1,202	100.0	15.0				
12	Harbour	15,971	5,810	2,266	8,076	341	278	619	413	199	7	619	1,988	7,457	704	5,039	1,714	100.0	12.3				
13	Kachaleeswarar Koil	12,793	4,628	2,861	7,489	272	245	517	338	170	9	517	2,616	6,972	636	4,740	1,596	100.0	11.8				
14	Kothawal Bazar	15,117	3,694	3,204	6,898	275	243	518	420	94	4	518	2,961	6,380	106	4,984	1,290	100.0	2.1				
15	Sowcarpet	15,271	2,279	2,221	4,500	277	265	542	407	103	32	542	1,956	3,958	103	3,310	545	100.0	3.0				
16	Trevelyan Basin	29,196	3,127	3,773	6,900	546	541	1,087	815	265	6	1,086	3,232	5,813	110	5,551	152	100.0	2.0				
17	Choolai	52,977	6,956	7,538	14,494	967	948	1,955	1,601	300	14	1,915	6,590	12,579	297	9,915	2,367	100.0	3.0				
18	Pulianthope	44,194	6,232	4,344	10,576	892	811	1,703	1,303	389	10	1,703	3,533	8,873	358	7,073	1,442	100.0	4.8				
19	Perambur Barracks	29,505	5,642	3,459	9,101	598	561	1,159	945	209	5	1,159	2,898	7,942	232	6,292	1,418	100.0	3.6				
20	Sembium	30,285	5,238	5,254	10,492	707	625	1,332	1,017	296	19	1,332	4,629	9,160	89	6,779	2,292	100.0	1.3				
21	Aynavaram	28,818	3,454	3,326	6,780	565	552	1,117	900	194	23	1,117	2,774	5,663	277	4,495	891	100.0	5.8				
22	Kilpauk	22,916	3,416	3,009	6,425	362	392	754	641	99	13	753	2,617	5,671	196	4,708	767	100.0	4.0				
23	Purasawalkam	30,746	2,186	2,191	4,377	412	381	793	635	149	5	789	1,810	3,584	72	2,821	691	99.8	2.5				
24	Kosapet	39,634	3,484	2,704	6,188	636	589	1,225	1,051	156	18	1,225	2,115	4,963	166	3,682	1,115	100.0	4.3				
25	Vepery	17,434	2,743	1,766	4,509	294	280	574	480	94	..	574	1,486	3,935	176	3,617	142	100.0	4.7				



26 Periamet	...	31,563	3,784	4,146	7,930	523	487	1,010	843	152	15	...	1,010	...	3,261	3,659	6,920	183	5,734	1,003	100.0	3.1
27 Edapalayam	...	18,482	2,825	2,726	5,551	356	322	678	467	204	7	...	678	...	2,469	2,404	4,873	236	3,954	683	100.0	5.6
28 Park Town	...	16,235	4,361	2,701	7,062	259	253	512	354	133	24	1	512	...	4,102	2,448	6,550	105	4,826	1,619	100.0	2.1
29 Napier Park	...	19,558	4,603	4,382	8,985	320	328	648	539	104	2	...	645	2	4,283	4,054	8,337	310	4,043	3,984	99.7	7.1
30 Chintadripet	...	26,497	3,381	3,397	6,778	421	400	821	638	136	19	1	794	27	2,960	2,997	5,957	270	4,222	1,465	100.0	6.0
31 Komaleeswaranpet	...	27,940	3,158	2,908	6,066	392	444	836	681	146	7	2	836	...	2,766	2,464	5,230	131	3,380	1,719	100.0	3.7
32 Egmore	...	16,704	3,781	4,530	8,311	252	235	487	383	96	8	...	487	...	3,529	4,295	7,824	159	5,710	1,955	100.0	2.7
33 Thousand Lights	...	31,342	6,284	6,598	12,882	551	537	1,088	850	223	15	...	1,088	...	5,733	6,061	11,794	280	8,242	3,272	100.0	3.3
34 Nungambakkam	...	27,407	1,949	2,647	4,596	411	354	765	554	199	12	...	765	...	15,38	2,293	3,831	104	3,384	343	100.0	3.0
35 Kodambakkam	...	37,134	5,002	4,872	9,874	720	671	1,391	1,072	286	27	6	1,391	...	4,282	4,201	8,483	489	6,206	1,788	100.0	7.3
36 Theagaraya Nagar (North)	...	21,373	2,639	2,325	4,964	347	328	675	519	135	19	2	675	...	2,292	1,997	4,289	360	3,474	455	100.0	9.4
37 Royapettah	...	23,344	5,456	5,472	10,928	442	415	857	682	167	8	...	857	...	5,014	5,057	10,071	187	8,790	1,094	100.0	2.1
38 Pudurakkam	...	28,672	4,978	4,639	9,617	538	426	964	720	240	4	...	964	...	4,440	4,213	8,653	200	7,214	1,239	100.0	2.7
39 Thiruwateeswaranpet	...	30,363	4,565	4,023	8,588	530	525	1,055	867	173	15	...	1,055	...	4,035	3,498	7,533	243	6,130	1,160	100.0	3.8
40 Chepauk	...	24,267	3,051	3,115	6,166	416	378	794	607	165	22	...	794	...	2,635	2,737	5,372	149	3,984	1,239	100.0	3.6
41 Triplicane	...	26,777	4,810	4,803	9,613	549	543	1,092	626	401	30	...	1,057	35	4,261	4,260	8,521	342	5,921	2,258	100.0	5.5
42 Zam Bazaar	...	25,044	2,684	2,300	4,984	470	441	911	735	162	14	...	911	...	2,214	1,859	4,073	87	3,241	745	100.0	2.6
43 Mirasaibpet	...	44,180	7,012	8,202	15,214	864	806	1,670	1,364	255	50	1	1,670	...	6,148	7,396	13,544	319	11,854	1,371	100.0	2.6
44 Mylapore (North)	...	38,734	5,203	4,138	9,341	607	614	1,221	932	259	29	1	1,221	...	4,596	3,524	8,120	339	6,549	1,232	100.0	5.0
45 Mylapore (South)	...	25,745	3,443	4,177	7,620	401	380	781	552	207	21	1	781	...	3,042	3,797	6,839	249	3,993	2,597	100.0	5.9
46 Teynampet	...	33,477	4,470	4,286	8,756	736	638	1,374	1,135	225	14	...	1,374	...	3,734	3,648	7,382	312	6,319	751	100.0	4.7
47 Theagaraya Nagar (South)	...	35,392	8,670	7,776	16,446	924	812	1,736	1,232	473	31	...	1,736	...	7,746	6,964	14,710	1,220	11,854	1,636	100.0	9.3
48 Saidapet	...	34,466	4,941	5,254	10,195	653	604	1,257	1,001	234	20	2	1,257	...	4,288	4,650	8,938	550	6,370	2,018	100.0	8.0
49 Guindy	...	17,416	3,179	2,180	5,359	299	272	571	415	146	10	...	571	...	2,880	1,908	4,788	171	4,047	570	100.0	4.1
50 Adyar	...	28,098	4,191	4,377	8,568	560	517	1,077	815	245	17	...	1,077	...	3,631	3,860	7,491	299	5,632	1,560	100.0	5.0
Fort St. George	...	2,280	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	..	14,16,056	2,11,207	1,98,569	4,09,776	25,737	24,411	50,148	38,732	10,430	823	21	50,006	115	1,85,470	1,74,158	3,59,628	13,662	2,73,982	71,984	99.9	4.7



Vaccinations performed during each month in 1954

APPENDIX I

Months	Primary Vaccination						Revaccination					
	Number of Persons Vaccinated			Results			Number of Persons Vaccinated			Results		
	Males	Females	Total	Success-ful	Failure	Absent	Males	Females	Total	Success-ful	Failure	Absent
January	2,285	2,166	4,451	4,438	...	13	15,066	14,989	30,055	1 094	23,497	5,464
February	2,903	2,738	5,641	5,640	1	...	30,025	30,163	60,188	2,643	45,171	12,374
March	2,717	2,491	5,208	5,203	...	5	36,600	33,737	70,337	2,493	54,469	13,375
April	2,171	2,072	4,243	4,242	1	...	19,882	18,477	38,359	1,199	28,815	8,345
May	1,947	1,837	3,784	3,775	...	9	12,018	10,501	22,519	907	17,172	4,440
June	2,066	1,899	3,965	3,954	3	8	10,102	9,076	19,178	567	14,669	3,942
July	1,964	1,936	3,900	3,892	4	4	10,086	10,190	20,276	724	14,366	5,186
August	1,815	1,858	3,673	3,661	8	4	8,386	8,440	16,826	695	12,631	3,500
September	1,875	1,732	3,607	3,581	5	21	8,861	8,096	16,957	647	13,281	3,029
October	1,671	1,561	3,232	3,213	3	16	7,204	7,459	14,663	539	11,548	2,576
November	2,220	2,065	4,285	4,266	1	18	12,007	10,496	22,503	1,053	17,140	4,310
December	2,103	2,056	4,159	4,141	1	17	15,233	12,534	27,767	1,101	21,223	5,443
Total	25,737	24,411	50,148	50,006	27	115	1,85,470	1,74,158	3,59,628	13,662	2,73,982	71,984



## MEDICAL RELIEF

## STATEMENT No. I

## Out-turn of Work in Dispensaries in 1954

Serial No.	Division No.	Year of Opening	Dispensary (Location)	Total Attendance		New Cases		Minor Operations	Remarks.
				1953	1954	1953	1954		
1	1	924	Royapuram ...	73,544	74,611	36,929	40,686	100	Allopathic.
2	2	1952	Palmyrah Kuppam.	77,080	92,639	39,581	45,227	Nil.	"
3	5	1913	Washermanpet ...	67,717	125,708	66,144	66,377	442	"
4	6	1929	Vyasarpady ...	69,770	65,425	35,792	33,005	217	"
5	6	1928	Perambur ...	87,667	87,487	54,335	53,324	441	"
6	8	1923	Mint ...	148,299	132,550	67,940	64,542	339	"
7	11	1929	Harbour ...	108,034	80,620	44,483	38,156	434	"
8	14	1923	Mafuzkhan ...	90,433	96,243	43,742	45,006	287	"
9	16	1919	Trevelyn Basin ...	81,563	98,247	36,074	36,533	...	"
10	17	1899	Baliah Naidu ...	123,788	153,670	64,946	82,952	...	"
11	20	1946	Sembiem ...	74,806	78,603	42,224	45,302	162	"
12	21	1948	Ayanavaram ...	93,161	86,438	40,677	43,846	171	"
13	23	1919	Kilpauk ...	60,443	72,249	35,553	38,475	337	"
14	24	1929	Kosapet ...	96,617	102,914	51,500	52,334	976	"
15	29	1909	Chintadripet ...	141,439	127,552	67,642	58,644	138	"
16	34	1923	Nungambakkam ...	85,898	80,264	48,116	46,054	126	"
17	32	1923	Egmore ...	76,045	68,473	38,034	36,962	45	"
18	35	1948	Kodambakkam ...	52,869	63,321	30,342	35,156	68	"
19	37	1924	Pudupakkam ...	65,970	64,491	33,080	29,872	103	"
20	41	1918	Triplicane ...	137,498	129,834	68,058	60,492	61	"
21	43	1938	Krishnampet ...	105,067	93,704	55,772	47,776	94	"
22	45	1924	Mylapore ...	90,012	72,290	45,813	38,563	107	"
23	46	1927	Teynampet ...	51,401	127,075	103,108	61,776	1,399	"
24	47	1922	Theagarayanagar ...	135,134	122,909	64,985	59,860	208	"
25	50	1948	Adyar ...	58,731	42,386	28,093	14,670	239	"
26	33	1930	Thousand Lights ...	99,541	97,255	48,058	46,355	885	For Women & Children only (Ayurvedic.)
27	13	1938	Mannady ...	54,299	62,981	22,729	26,477	61	Unani.
28	18	1930	Puliantope ...	109,630	71,375	41,597	37,883	166	"
29	31	1939	Pudupet ...	71,722	62,198	33,125	30,134	136	"
30	39	1932	Thiruvateeswaranpet ...	95,054	97,688	43,821	45,908	305	"
31	3	1945	Royapuram ...	64,767	80,082	37,256	45,642	Nil.	Siddha.
32	17	1931	Choolai ...	155,879	162,402	69,596	76,226	97	"
33	19	1931	Otteri ...	89,198	99,694	54,667	54,927	48	"
Total ...				2,993,076	3,093,378	1,593,810	1,539,142	8,786	



## Details of Skin and Leprosy Cases treated in the Corporation Skin and Leprosy Clinics and General Dispensaries in 1954.

Name of the Institution	Date of opening	New Leprosy cases	Details of New Leprosy Cases						Number of Injections for Leprosy	Skin cases		Yearly attendance New and Old Skin and Leprosy cases	Average monthly attendance	
			Types		Results of Treatment					Number of New Skin cases	Number of Injections performed for Skin cases			
			Infective	Non-Infective	Number cured	Number Improved	Number symptoms free	Number arrested						Number otherwise
Skin & Leprosy Clinic, Beasant Road, Triplicane ...	2-2-34	362	55	307	...	142	27	46	147	7,576	14,594	642	35,711	2,976
Vyasarpady Clinic ...	4-8-31	1,103	243	860	...	276	22	101	704	18,989	2,698	...	32,288	2,691
Corporation General Dispensaries ...	...	14	1	13	...	...	...	...	14	..	80,857	168	130,033	10,836
Total ...	..	1,479	299	1,180	...	418	49	147	865	26,565	98,149	810	198,032	16,503



## Results of Survey of Leprosy from 1-1-54 to 31-12-54

Area Surveyed	Population										Cases of Leprosy detected										Gross incidence per 1,000 population examined	Child incidence per 1,000 population examined	Sex incidence (Male)	Sex incidence (Female)	Sex rate male case per 100 cases of Leprosy	Child rate per 100 cases of Leprosy	Open case rate per 100 cases of Leprosy	Suspicious cases for observation	Total of Leprosy cases.
	Enumerated					Examined					Infective					Non-infective													
	Males	Females	Male Children	Female Children	Total	Males	Females	Male Children	Female Children	Total	Males	Females	Male Children	Female Children	Total	Males	Females	Male Children	Female Children	Total									
1. Block 1 (28 Streets)	2198	2440	1491	1598	7727	7027	2368	1393	1528	7316	1	4	1	2	8	5	10	9	8	32	5.46	6.84	1.90	6.16	40.00	50.00	20.00	4	40
2. Block 2 (19 Streets)	2839	3434	2257	2352	10882	2737	3348	2194	2275	10554	5	1	1	...	7	4	12	4	6	26	3.12	2.46	2.84	3.38	42.43	33.30	21.21	3	33
Total	5037	5874	3748	3950	18609	4764	5716	3587	3803	17870	6	5	2	2	15	9	22	13	14	58	4.09	4.19	3.59	4.52	41.09	42.46	20.55	7	73
1. Block A (13 Streets)	6107	6001	3601	3713	19422	1747	4567	2634	2828	11776	8	6	2	1	17	24	48	42	43	157	10.5	16.1	17.3	13.2	43.6	50.5	9.7	59	...
Total	6107	6001	3601	3713	19422	1747	4567	2634	2828	11776	8	6	2	1	17	24	48	42	43	157	10.5	16.1	17.3	13.2	43.6	50.5	9.7	59	...



### Details of cases treated at the Infectious Diseases Hospital, Tondiarpet, during 1954

## APPENDIX I

	Cholera	Gastro-Enteritis - Chronic Enteritis Diarrhoea Dysen- tery, etc.	Small-pox	Chicken-pox	Measles	Typhoid	Diphtheria	Mumps	Malaria	Whooping cough	Other diseases	Contacts	Total
Patients in the Hospital on 1-1-54.	12	20	106	68	5	...	...	...	...	...	9	19	239
Patients admitted during the year. { City ...	38	1,014	1,181	2,185	1,108	...	1	20	8	8	244	1,540	7,347
{ Mufusal ...	43	123	103	186	67	1	...	1	...	...	58	...	582
Total number of patients treated during the year ...	93	1,157	1,390	2,439	1,180	1	1	21	8	8	311	1,559	8,168
Total number discharged ...	86	927	1,027	2,397	1,177	1	1	21	6	8	238	1,523	7,412
Number died ...	7	210	289	...	...	...	...	...	2	...	67	...	575
Mortality Percentage ...	7·5	18·2	21·8	...	...	...	...	...	25%	...	21·5	...	7%
Patients remaining at the Hospital on 31-12-54 ...	...	20	74	42	3	...	...	...	...	...	6	36	181



MEDICAL RELIEF

STATEMENT No. V

Details of work in the Six Tuberculosis Clinics during 1954

(1)	(2)	Corporation Tuberculosis Clinic at Puliantope (3)	Clinics at				Government T. B. Institute at Egmore (8)	Total (9)
			Government Royapettah Hospital (4)	Government Stanley Hospital (5)	Government General Hospital (6)	Government Kasturba Gandhi Hospital (7)		
1	No. of new cases examined:							
	Men	4,119	2,380	3,175	3,940	110	8,133	21,857
	Women	3,012	1,112	1,981	1,799	2,500	2,890	13,294
	Children	2,144	392	786	476	1,059	1,735	6,592
	Total	9,275	3,884	5,942	6,215	3,669	12,758	41,743
2	No. of P. T. cases detected:							
	P. T. I	17	56	32	754	104	419	1,382
	P. T. II	50	29	10	2	139	448	678
	P. T. III	1,193	985	999	3,196	282	2,189 147	8,991
	Total	1,260	1,070	1,041	3,952	525	3,056	11,051
3	No. of non P. T. cases:	120	92	149	47	175	353	936
4	Total No. of T. B. cases detected:	x	1,070	999	130	x	x	1,299

x Separate figures are not available.



## Details of work in the Six Tuberculosis Clinics during 1954

(1)	Particulars (2)	Corporation Tuberculosis Clinic at Puliantope (3)	Clinics at				Government T. B. Institute at Egmore (8)	Total (9)
			Government Royapettah Hospital (4)	Government Stanley Hospital (5)	Government General Hospital (6)	Government Kasturba Gandhi Hospital (7)		
5	<i>No. of old cases attended :</i>							
	Men	24,275	7,422	16,415	12,659	Nil	28,562	89,333
	Women	14,605	3,575	12,978	5,091	8,688	13,078	58,015
	Children	3,244	545	4,294	1,135	1,552	4,383	15,153
	Total	42,124	11,542	33,687	18,185	10,240	46,023	162,501
6	No. of A. P. initials	60	10	25	32	4	72	203
7	No. of A. P. re-fills	1,083	240	154	222	18	885	2,602
8	No. of patients attended for A. P. re-fills	125	84	57	72	8	×	346
9	No. of P. P. initials	57	17	48	81	9	76	288
10	No. of P. P. re-fills	2,453	811	1,319	3,352	237	2,365	10,537
11	No. of patients attended for P. P. re-fills	147	331	535	804	102	×	1,919



12	No. of Fluoroscopic examinations done	11,015	2,906	3,054	8,395	x	x	25,370
13	No. of Radiography done	848	910	x	7,538	x	x	9,236
14	No. of Aspirations done	1	17	37	154	17	x	226
15	No. of Houses visited by Medical Officers	Nil	556	415	541	376	x	1,888
	Health Visitors	1,380	1,330	2,808	2,338	1,256	x	9,172
	Total	1,380	1,946	3,223	2,879	1,632	x	11,060
16	No. of Contacts examined	1,287	588	2,112	2,198	1,035	x	7,220
17	No. of P. T. cases found among contacts—							
	P. T. I	21	3	52	59	18	x	153
	P. T. II	6	2	4	Nil	21	x	33
	P. T. III	34	17	17	71	35	x	174
	Total	61	22	73	130	74	x	360
18	B. C. G. Vaccinated	185	x	x	32	69	x	286
19	Family planning—							
	(a) No. advised	x	20	42	122	19	x	203
	(b) No. attended Clinic	x	9	41	104	10	x	164

x. Separate figures are not available.



## MEDICAL RELIEF

## STATEMENT No. VI

Details of work done by the B. C. G. Teams during 1954

Particulars.		Corporation Schools.	T. B. Clinic Puliantope.	B. C. G. Clinic Ashok Vihar.
Number of Mantex Tested	..	10,428	1,245	689
Number Positive	..	5,408	496	536
Number Negative	..	3,860	185	153
Number B. C. G. Vaccinated	..	3,497	183	137

In addition, the B. C. G. Team maintained by the Corporation, attended to Tuberculin Tests and mass X-ray work at the Standard Vacuum Oil Company Ltd. The Team also visited the I. A. F. Training Centre at Tambaram and the Y. M. C. A. Boys Town and did Tuberculin Tests and B. C. G. Vaccination during the year.



## MEDICAL RELIEF

**Corporation Sri Thiruvotteswarar Tuberculosis Hospital**

The year opened with 55 patients left over from the previous year. There were 151 new admissions thus making a total of 206 patients treated for the year. The total number of discharges including deaths (4) during the year was 155 leaving 55 patients at the end of the year, 47 indigent patients and 8 special ward patients. The particulars of the 151 admissions are as follows :

Daily average number of patients treated during the year :

1. General Wards :	47·8	Males :	38·7
2. Special Wards :	5·3	Females :	14·4
	<u>53·1</u>		<u>53·1</u>

*Particulars of Admitted cases :**Sex Distribution :*

Males 108                      Females 43                      Total 151.

*Age Distribution :*

Age Groups	Males	Females	Total
0 to 4 years	...	...	...
5 to 14 years	...	1	1
15 to 24 years	29	17	46
25 to 44 years	66	23	89
45 to 64 years	14	1	15
65 and above	...	...	...
Total	109	42	151

*Classification of Discharged Cases :—*Classification of the stage of disease and results adopted here are based on the recommendation of the Tuberculosis Association of India. Out of the 155 (including 4 deaths) patients discharged during the year 153 are Tuberculosis cases and 2 were non-Tuberculous cases i.e., 2 Pneumonities.

1. *Type and Stage of Disease of Tuberculosis cases :*

Pulmonary Tuberculosis	Stage I	Stage II	Stage III	Total
(a) ...	8	8	44	60
(b) ...	3	6	27	36
(c) ...	1	1	55	57
Total ...	12	15	126	153



Out of 133 Tuberculosis cases discharged during the year 18 patients stayed for periods less than one month. These 18 cases are therefore excluded from the results. Thus it will be seen that 75·9% of the admissions were in the advanced or III stage of the disease. 155 discharges shown above includes 4 deaths of which 1 death only taken into statistics and 3 deaths are out of the statistics as the period of stay of these 3 cases, was less than a month.

2. *Results of Treatment*:—(135 Tuberculosis cases considered for statistics).

		Stage I			Stage II			Stage III			Total
		A.	B.	C.	A.	B.	C.	A.	B.	C.	
Quiescent	...	3	1	...	2	1	...	...	2	2	11
Much improved	...	2	2	1	3	4	...	18	10	6	46
Improved	...	1	...	...	...	..	1	22	12	28	64
Stationary	...	1	...	...	1	...	...	1	2	8	13
Worse	...	..	...	...	...	..	...	..	..	...	...
Died	...	..	...	...	1	...	...	...	...	...	1
Total	..	7	3	1	7	5	1	41	26	44	135

Out of the 135 cases discharged, 121 cases or 89·6% had positive result of treatment. Large majority of cases (i.e.) over 126 out of 135 were in the advanced or III stage of the disease. Out of 135 cases in Stage II, 10 cases showed positive result of treatment i.e., in the II stage of the disease, over 76·9% had positive results and 11 cases in Stage I, 10 showed positive result of treatment i.e., 91% showed positive result of treatment.

### Surgical Treatment.

#### 1. *Artificial Pneumothorax*:—

(a) No. of cases in which it was tried	...	Right side	...	20
		Left side	...	9
				29
(b) No. of cases in which it was successful		Right side	..	16
		Left side	...	7
				23
(c) No. of cases in which it was unsuccessful		Right side	...	4
		Left side	...	2
				6
(d) Bilateral A.P.			...	...
(e) No. of cases in which A.P. was started outside prior to admission to this Hospital			...	32



## APPENDIX I

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(f) Total No. of patients who received A.P. treatment	...	87
(g) Total No. of A.P. refills given to In-patients and Out-patients	...	707
2. <i>Aspiration of Fluids</i> :—Done	...	4 times.
3. <i>Aspiration of Air</i> :—Done	...	2 „
4. No. of cases in which Pneumoperitoneum was given (48 patients received)	...	897 refills.
5. No. of cases in which Initial Pneumoperitoneum was given	...	24
6. Thoracoscopy and Cauterisation of Adhesions	...	33
7. Phrenic Paralysis :	...	Nil

### Medical Treatment

#### *Antibiotics* :—

1. Streptomycin. No. of cases treated	...	46
2. Calcium salt of Para Amino Salicylic Acid Treatment	...	107
3. Conteban :	...	Nil
4. Isonicotinic Acid Hydrazide :	...	105

#### *X-Ray Work* :—

1. No. of Fluoroscopic Examinations done	...	1797
2. X-Ray Skiagrams taken in the Hospital	...	296

### Tubercle Bacilli

Of the 155 cases discharged, 2 turned out as non-Tuberculous, 18 cases stayed less than one month and hence excluded from the statistics. Of the 155 patients on discharge 8 were negative by smear, 58 negative by concentration and 56 negative by culture and 33 remained positive to Tubercle Bacilli, i.e., 60.7% of the discharged patients had negative sputum and were non-infectious.

Total No. of Sputum samples sent for culture to Path. Lab. Corporation of Madras during 1954	...	66
C.S.F.	...	...
Widal and Blood Culture	...	...
Gel and Chopra	...	...
Vanden Bergh	...	..
Kahn Test	...	3

### Laboratory Work

1. Motion Routine Examinations :	...	152
2. Urine Examinations :—Routine	...	153
Albumin	...	153
Sugar—qualitative	...	1360
quantitative	..	866



3. Sputum for A.F.B.—Smear	..	2335
Concentration	...	455
*Culture	...	66
4. Blood Examination :—Differential counts	...	825
B.S.R.	...	825
For M.P.	...	10
Index	...	825

(\* at Corporation Pathology Laboratory.)

5. *Examination of Pleural Fluid for Tubercle Bacilli Complications :—*

1. Effusion on A.P. side	...	13
2. Intestinal Tuberculosis	...	3
3. Haemoptysis	...	4
4. Coloured Sputum	...	12
5. Ascariasis	...	1
6. Diabetis	...	7
7. Tracheo Bronchitis	...	6
8. Laryngitis	...	5
9. Perianal Tuberculosis	...	1
10. Secondary Anaemia	...	5
11. Glands	...	4 neck and 1
12. Pleurisy (Wet)	...	5 mediastenil
13. Spontaneous Pneumothorax	...	3
14. Hansen	...	4
15. Abdominal T.B. Peritonitis	...	2
16. Miliary Tuberculosis	...	2
17. Arthritis Shoulder	..	1
18. V.D.H.	...	1
19. Tenosynovitis Tuberculosis	...	1
20. Cold Absciss	...	1
21. Med Hernia	...	3
22. Malaria	...	3

The following gentlemen visited the Hospital during the course of the year and made appreciative reference to the work done in the institution in the remarks recorded in the ' *Visitors Diary* ' during the year 1954.

<i>Name of the visitor</i>	<i>Visited on</i>
1. Lt.-Col. Sangham Lal, Director of Medical Services, Madras	.. 22- 2-54
2. Dr. R. V. Rajam, Director of Upgraded Venereal Department, Government General Hospital, Madras	... 11-11-54



## MEDICAL RELIEF

## STATEMENT

## PUBLIC HEALTH LABORATORY (1954)

I. *Details of Manicke, VDRL and Kahn Tests in 1954*

S. No.	Source	No. of Positive cases	No. of Negative cases	Doubtful	Total
	Child-Welfare Scheme Centre ...	791	13,158	58	14,007
2	Private Practitioners ...	258	2,278	58	2,594
3	Venereal Clinic ...	437	1,040	59	1,536
	Total ...	1486	16,476	175	18,137

II. *Details of Work done on Various Specimens*

Blood	Other Smears	Sputum	Wine	Motion	Total
34,664	364	2,422	2,714	3,106	43,070

III. *Details of the Source of Specimens*

Private Practitioners	C.W.C.	Corporation Dispensaries	Clinics	Others	Total
23,119	14,022	1,390	2,009	2,530	43,070

IV. *Schedule Rates for the Examination of Specimens.*

			Rs. A. P.
Blood ordinary examination	Per Test	...	1 0 0
„ for Agglutination (Widal)	„	...	2 0 0
„ culture of B Typhus Enteric	„	...	2 0 0
„ culture Bacterial Cendo cardities	„	...	2 0 0
„ for Khan Test	„	...	2 0 0
„ for VDRL Test	„	...	2 0 0
„ for VDRL quantitation estimation	„	...	2 0 0
C.S.F. for Khan Test	„	...	2 0 0
„ for V.D.R.L. Test	„	...	2 0 0
„ for T.B. Culture	„	...	2 0 0
Sputum for T.B. Culture	„	...	2 0 0
Nasal Swab for C. Diphtheria Culture	„	...	2 0 0
Skin Scraping for Hansans Bacilli	„	...	1 0 0
Urine quantitative Examination	„	...	1 8 0
Urine quantitative (Sugar %) Exam.	„	...	1 0 0
Urine Albumen quantitative (%)	„	...	1 0 0
Urethral smears for other Exam.	„	...	1 0 0
Urine deposit for A.F.B. Exam.	„	...	1 0 0
Motion for microscopic Exam.	„	...	1 0 0
Motion for culture Exam.	„	...	2 0 0
Urine for cultre Exam.	„	...	2 0 0



## STATEMENT No. 1.

1954-55

## MEDICAL INSPECTION

No.	Defects	Boys										Girls										Remarks										
		Entrants					Regulars					Total of entrants & regulars					Entrants						Regulars					Total of entrants & regulars				
		Percentage					Percentage					Percentage					Percentage						Percentage					Percentage				
		No. Defective					No. Defective					No. Defective					No. Defective						No. Defective					No. Defective				
		1954-55	1953-54	No. Defective	1954-55	1953-54	1954-55	1953-54	No. Defective	1954-55	1953-54	1954-55	1953-54	No. Defective	1954-55	1953-54	1954-55	1953-54	No. Defective	1954-55	1953-54		1954-55	1953-54	No. Defective	1954-55	1953-54	1954-55	1953-54	No. Defective		
1	Malnutrition	1046	17.30	17.42	556	8.70	9.69	1602	12.09	905	12.63	13.70	727	13.63	15.69	1632	13.06															
2	Dirty head, body and nails.	723	11.96	9.53	384	6.20	6.32	1107	8.91	97	1.35	1.25	104	1.95	1.51	201	1.61															
3	Teeth and mouth	966	15.98	13.47	762	11.94	9.30	1728	13.91	601	8.39	7.03	412	7.72	6.49	1013	8.11															
4	Nose and throat	409	6.76	6.66	254	3.98	3.74	663	5.34	539	7.52	6.30	685	12.84	11.15	1224	9.79															
5	Eye diseases	113	1.87	1.61	165	2.59	1.04	278	2.24	193	2.76	3.28	180	3.37	3.03	378	3.02															
6	Vision	8	0.13	0.15	9	0.14	0.15	17	0.14	9	0.13	0.15	8	0.15	0.43	17	0.14															
7	Ear diseases	34	0.56	0.91	15	0.24	0.48	49	0.39	68	0.95	0.83	52	0.97	0.97	120	0.96															
8	Hearing	6	0.10	0.04	3	0.05	0.01	9	0.07	1	0.01	...	5	0.09	0.02	6	0.05															
9	Speech	7	0.12	0.06	5	0.08	0.01	12	0.10	...	...	0.02	...	...	0.02	...	...															
10	Circulatory system	18	0.30	0.40	15	0.24	0.25	33	0.27	94	1.31	1.40	102	1.91	2.15	196	1.57															
11	Tuberculosis	3	0.05	0.07	1	0.02	0.04	4	0.03	2	0.03	...	1	0.02	0.02	3	0.02															
12	Respiratory system	18	0.30	0.66	10	0.16	0.48	28	0.23	54	0.75	0.59	44	0.82	0.85	98	0.78															
13	Abdominal organs	22	0.36	0.53	18	0.28	0.28	40	0.32	24	0.33	0.04	21	0.39	0.19	45	0.36															
14	Bones and joints	195	3.23	5.47	127	1.99	3.05	322	2.59	81	1.13	0.90	57	1.07	1.09	138	1.10															
15	Nervous and psychicsystem	2	0.03	0.04	3	0.05	0.03	5	0.04	4	0.06	0.18	6	0.11	0.09	10	0.08															
16	Infectious & Contagious diseases	300	4.96	4.93	226	3.54	2.99	526	4.23	479	6.63	5.78	334	7.20	6.01	863	6.91															
17	Other diseases and defects.	75	1.24	2.27	47	0.74	1.20	122	0.98	111	1.55	1.42	98	1.34	1.68	209	1.67															
18	Vaccination	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...														
19	Deformities	8	0.13	0.23	15	0.24	0.34	23	0.19	14	0.20	0.09	10	0.18	0.14	24	0.19															



MEDICAL INSPECTION

APPENDIX TO STATEMENT No. I.

Group	No. on roll		Average daily attendance		No. examined		No. defective		Percentage	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Entrants	18,950	15,973	17,243	13,374	6,046	7,164	2,821	2,578	46·66	35·99
Regulars					6,381	5,334	2,582	2,160	40·46	40·49
Total ...	18,950	15,973	17,243	13,374	12,427	12,498	5,403	4,738	43·48	37·91

MEDICAL INSPECTION

Treatment Table

STATEMENT No. II.

Group	No. treated at Schools	No. sent to Corporation Dispensaries	No. sent to Government Hospitals	No. referred to Govt. Ophthalmic Hospital	No. referred to Tuberculosis Institute	No. of parents met	No. of re-visits paid to Schools	No. of re-examinations of children
Boys	4,240	944	508	48	2	889	220	4,841
Girls	3,959	465	476	36	3	514	95	7,895
Total ...	8,199	1,409	984	84	5	1,403	315	12,736

MEDICAL INSPECTION

Height and Weight Tables

STATEMENT No. III.

Age	Average height in inches		Average weight in pounds		Quinquennial average height in inches		Quinquennial average weight in pounds	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
3	...	31·00	...	14·00	...	...	...	...
4	...	35·73	...	24·16	...	...	...	...
5	39·92	38·19	32·71	30·15	39·74	38·49	32·27	30·12
6	40·11	39·89	35·19	32·92	40·59	40·37	33·64	32·31
7	42·44	43·72	36·29	35·17	42·36	42·03	35·76	34·65
8	44·22	45·74	38·41	38·50	44·60	43·87	38·89	37·43
9	46·08	46·11	42·16	41·31	46·53	45·93	42·54	40·62
10	48·11	47·90	46·97	44·68	48·48	47·98	45·63	43·52
11	50·15	50·30	50·40	49·09	49·51	50·33	50·03	48·07
12	50·63	52·09	51·92	53·33	51·02	52·50	51·86	52·65
13	52·59	54·43	55·51	59·31	52·84	53·55	55·29	58·87
14	54·19	56·89	57·81	68·17	55·34	57·01	59·52	69·17
15	55·88	58·30	63·91	75·25	56·42	58·91	64·91	75·73
16	58·60	60·06	73·55	87·72	...	...	...	...
17	62·82	60·72	80·84	92·30	...	...	...	...
18	65·95	61·71	92·50	101·49	...	...	...	...
19	...	61·77	...	86·75	...	...	...	...
20	...	61·33	...	85·67	...	...	...	...
21	...	62·00	...	92·50	...	...	...	...



## SANITATION

## STATEMENT No. I

## Length of Sewers laid in 1954

Serial No.	Name of Area	Length of Sewers laid in feet.
1	Tondiarpet (Cochrane Basin) ...	4,946
2	Perambur and Vyasarpadi ...	3,150
3	Aminjikarai ...	10,427
4	Sembiam ...	6,000
5	Nammalwarpet ...	7,680
6	Purasawalkam ...	2,000
7	Ice House Road ...	1,000
8	Ayanavaram ...	2,500
9	Mylapore ...	9,000
10	Kilpauk ...	600
11	Theagarayanagar ...	1,500
12	Langs Garden ...	1,000
Total ...		49,803



## SANITATION

## STATEMENT II

Statement showing disposal of applications for licences in 1954.

Serial No.	Description of trade	No. of cases dealt with	No. Sanctioned	No. Refused	No. Pending
1	Aerated water and ice factory ...	78	64	2	12
2	Bakery, sweetmeat stalls and coffee hotels...	946	887	49	10
3	Candles and soaps ...	27	23	1	3
4	Coconut fibre, hemp and jute ...	35	32	...	3
5	Cattle yards ...	1,298	1,207	64	27
6	Bones, hoofs, hair and wool ...	29	29	...	...
7	Cart and cycle stands ...	53	53	...	...
8	Dairy produce ...	326	326	...	...
9	Flour ...	278	278	...	...
10	Grinding and condiments ...	352	308	26	18
11	Hack stables ...	5	5	...	...
12	Dyeing ...	107	88	8	11
13	Onions and garlic ...	86	86	...	...
14	Oil and oil mills ...	582	573	4	5
15	Lodging houses ...	124	95	12	17
16	Markets ...	43	43	...	...
17	Meat ...	115	78	24	13
18	Spirit, turpentine, chemical & rosins ...	264	246	8	10
19	Laundries ...	673	622	25	26
20	Fish and fins ...	12	12	...	...
21	Skin, hides and leather ...	245	194	23	28
22	Paddy boiling ...	10	6	2	2
23	Sugar ...	...	...	...	...
24	Catagut, offal and tallow ...	4	4	...	...
25	Snuff ...	146	95	27	24
26	Cotton ...	183	183	...	...
27	Eating houses ...	125	913	189	75
28	Swine ...	...	...	...	...
29	Lime kilns ...	45	25	7	13
30	Beedi manufacturing ...	263	202	35	26
31	Manufacturing cigars, cigarettes, storing tobacco ...	187	175	4	8
32	Camphor storing and boiling ...	4	8	2	2
33	Shaving saloon ...	1,483	1,404	65	14
34	Husking paddy ...	5	2	1	2
35	Groundnut storage ...	92	92	...	...
36	Grain storage ...	2,364	2,364	...	...
37	Gold refining ...	27	27	...	...
38	Poultry ...	8	1	...	...
Final Total		11,794	10,867	578	349



## APPENDIX I

Nature of samples.	1954			1949		1950		1951		1952		1953	
	Number of samples analysed.	Number of adulterated samples.	Percentage of adulterated samples.	Number of samples analysed.	Percentage of adulterated samples.	Number of samples analysed.	Percentage of adulterated samples.	Number of samples analysed.	Percentage of adulterated samples.	Number of samples analysed.	Percentage of adulterated samples.	Number of samples analysed.	Percentage of adulterated samples.
Milk	3,141	1,763	56.1	2,629	62.2	2,880	72.0	2,837	76.0	2,810	72.5	3,338	66.7
Butter	601	217	36.1	481	21.8	475	24.8	467	30.4	470	39.1	680	30.3
Ghee	798	216	27.1	688	10.9	725	11.3	718	24.0	683	31.3	910	19.3
Gingelly Oil	201	68	33.8	409	13.4	313	12.4	320	12.2	362	19.3	331	14.5
Groundnut Oil	123	5	4.1	160	5.0	86	4.7	57	5.3	36	2.8	30	3.3
Cocoanut Oil	163	12	7.4	195	3.1	286	11.5	234	9.8	156	6.4	143	2.8
Coffee Powder	120	68	56.7	222	4.1	196	2.0	176	10.2	169	55.6	127	32.3
Tea	21	3	14.3	30	..	22	...	33	15.2	35	...	31	...
Ghee Substitutes	31	6	19.4	14	35.7	19	26.3	13	38.5	30	16.7	21	19.0
Other articles	104	54	51.9	42	52.4	59	45.8	76	10.5	76	43.4	124	51.6
Total	5,303	2,412	45.5	4,810	39.9	5,061	47.2	4,931	52.2	4,827	54.8	5,735	44.8



APPENDIX I

Nature of samples.	Adulterated samples among the samples analysed in 1954.					Adulterated samples of the previous year pending disposal on 1-1-54.					Total number of adulterated samples dealt with during 1954.					Average fine per conviction in 1954.		Average fine per conviction in 1953.		
	Number of samples.	Number of convictions.	Number seized under Section 9 and forfeited or destroyed under Section 12 without prosecution.	Number taken under Sec. 14 but acquitted, withdrawn or not prosecuted.	Number pending disposal on 31-12-54.	Number of samples.	Number of convictions.	Number seized under Sec. 9 and forfeited or destroyed under Sec. 12 without prosecution.	Number taken under Sec. 14 but acquitted, withdrawn or not prosecuted.	Number pending disposal on 31-12-54.	Number of samples.	Number of convictions.	Number seized under Sec. 9 and forfeited or destroyed under Sec. 12 without prosecution.	Number taken under Sec. 14 but acquitted, withdrawn or not prosecuted.	Number pending disposal on 31-12-54.	Total fines imposed in 1954.	Average fine per conviction in 1954.	Number of convictions in 1953.	Total fines imposed in 1953.	Average fine per conviction in 1953.
Milk	1,763	963	...	71	729	2,087	479	...	1	1,607	3,850	1,442	...	72	2,336	25,884	18	1,682	31,544	19
Butter	217	143	3	...	71	137	57	...	...	80	354	200	...	...	151	3,789	19	186	3,764	20
Ghee	216	104	4	1	107	209	50	...	1	158	425	154	...	2	265	5,107	33	128	5,146	40
Gingelly Oil	68	49	...	...	19	17	12	...	...	5	85	61	...	...	24	1,392	23	60	1,035	17
Groundnut Oil	5	2	...	2	1	2	1	...	...	1	7	3	...	2	2	90	30	...	...	...
Cocoanut Oil	12	6	...	1	5	5	5	...	...	...	17	11	...	1	5	288	26	3	75	25
Coffee Powder	68	38	...	1	29	25	9	...	...	16	93	47	...	1	45	1,074	23	64	2,032	32
Tea	3	1	...	...	2	...	...	...	...	...	3	1	...	...	2	15	15	...	...	...
Ghee Substitutes	6	4	...	...	2	3	...	...	...	3	9	4	...	...	5	90	23	4	70	18
Other articles	54	25	...	8	21	29	17	...	7	5	83	42	...	15	26	815	19	48	1,120	23
Total	2,412	1,335	7	84	986	2,514	630	...	9	1,875	4,926	1,965	7	93	2,861	38,544	20	2,175	44,786	21



TABLE No. I

## WATER ANALYSIS

Showing the Number of Samples of water tested for Bacteriological and Chemical Purposes in 1954.

Serial No.	Description.	Number of Samples.	Remarks.
1	From the Sources of the Kortalayar River System	34	
2	From the Head-works at the Kilpauk Water Works	1,003	
3	From the Infiltration gallery well at Sembiam	18	
4	From the Infiltration gallery well at Saidapet	18	
5	From the Kortalayar distribution System	1,877	
6	From the Sembiam distribution System	125	
7	From the Saidapet distribution System	119	
8	From the Shallow wells at Adyar, Kodambakkam and Saidapet	27	
9	From Private wells	74	
10	From the Sterilisation of water mains	554	
	Total	3,849	



## WATER ANALYSIS

TABLE II

Monthly average levels in the three Reservoirs and the total monthly rainfall recorded in their catchments in 1954.

Months	Satyamoorti Sagar (Poondi Reservoir)		Sholavaram Reservoir		Red Hills Reservoir	
	Average lake level in feet.	Total rainfall recorded in the region (inches)	Average lake level in feet	Total rainfall recorded in the region (inches)	Average lake level in feet	Total rainfall recorded in the region (in inches)
January ...	134.04	2.31	59.29	1.61	45.60	1.68
February ...	133.39	Nil	59.35	Nil	44.55	Nil
March ..	132.55	Nil	58.02	Nil	43.28	Nil
April ...	131.57	Nil	56.30	Nil	41.77	Nil
May ...	130.55	0.26	54.09	Nil	39.87	Nil
June ...	127.18	1.43	50.37	0.32	39.69	0.42
July ...	126.91	5.77	48.25	7.03	39.18	8.72
August ...	131.24	6.13	50.70	5.91	38.58	4.45
September ...	131.05	2.43	51.36	2.73	38.04	3.55
October ...	132.43	12.13	51.31	10.73	38.89	11.12
November ...	132.69	Nil	57.94	1.75	44.00	1.26
December ...	133.96	10.39	58.58	10.06	45.10	10.77
Total ...	..	40.85	..	40.14	...	41.97



TABLE III

APPENDIX I

WATER ANALYSIS  
Limnological Conditions of the Sources of the City Water Supply : (a) Satyamurti Sagar in 1954  
(Results expressed in parts per 100,000)

Description.	28-1	26-2	30-3	30-4	26-5	29-6	29-7	30-8	29-9	29-10	29-12
A. Physical Conditions:											
Time	3.00 P.M.	3.00 P.M.	2.30 P.M.	3.30 P.M.	3.00 P.M.	3.30	2.00 P.M.	3.00 P.M.	2.30 P.M.	2.00 P.M.	1.30 P.M.
Colour	C.	C and C	H.	G.	G.	Y.	G.	Y.	Y.	Y.	Y.
Temperature (°C)	28.0	34.0	36.0	37.0	34.0	33.0	29.0	32.0	32.0	29.0	30.0
B. Chemical Conditions:											
Total Solids	17.2 —0.8	30.0 0.07	27.2 1.5	27.2 1.5	18.8 —0.2	22.8 ...	17.6 —0.3	18.0 —0.5	16.0 —0.5	22.8 —0.5	20.7 —0.7
Alkalinity to { Phenolphthalein... Methyl Orange ...	13.2 8.0 4.5	11.8 8.5 6.9	11.6 8.5 5.6	11.6 8.5 5.2	12.3 8.0 5.3	.. 8.7 1.0	11.0 8.0 6.3	11.9 7.9 5.6	12.2 8.0 6.3	8.8 8.0 4.2	11.3 8.0 5.6
P. H.											
Dissolved oxygen (cc/L)											
Chlorides	2.6	2.9	3.0	3.0	3.7	5.0	4.8	2.4	3.1	1.4	2.8
Oxygen absorbed (Tidy's)	0.166	0.140	0.161	0.161	0.280	0.253	0.252	0.147	0.219	0.151	0.204
Ammoniacal Nitrogen	Nil	Nil	Nil	Nil	Tr.	Nil	Nil	Nil	Nil	Nil	Nil
Albuminoid Nitrogen	0.008	0.008	0.029	0.024	0.028	0.40	0.332	0.040	0.032	0.004	0.052
Nitrous Nitrogen	M. Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.
Nitric Nitrogen	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Tr.	Nil
Phosphates (Po <sub>4</sub> )	<0.001	Nil	Nil	Nil	Nil	0.001	Tr.	0.001	Tr.	Nil	0.001
Silicates (Sio <sub>2</sub> )	0.3	0.2	0.2	0.2	0.4	1.0	0.2	0.2	0.4	0.6	0.1
Total hardness	6.0	6.2	6.0	6.0	5.2	5.2	7.0	8.0	7.0	10.4	10.2
Calcium hardness	3.0	3.0	2.1	2.1	...	...	...	...	...	...	...
Magnesium hardness	3.0	3.2	3.6	3.9	...	...	...	...	...	...	...
Iron	0.010	0.125	0.002	0.002	0.004	0.003	0.040	0.020	0.030	0.030	0.003
C. Bacteriological Conditions:											
B. Coli present in ? c.c. & upds?....	5.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.1	1.0

H = Hazy. C = Colorless. Y = Yellow. G = Green.



Limnological Conditions of the Sources of the City Water Supply: (b) Sholavaram Reservoir in 1951.  
(Results expressed in Parts per 100,000.)

Description	28-1	26-2	30-3	30-4	26-5	29-6	29-7	30-8	29-9	29-10	—	29-12
A. Physical Conditions:												
Time (A.M.)	10-30	11-30	11-30	10-30	12-10	12-30	11-30	11-00	11-30	11-00		3-15
Colour*	C.	C.	C.	C.	Yellow	P.G.	Brown	Yellow	Green	Yellow		C
Temperature (°C)	28.0	30.0	32.0	33.0	34.0	30.0	27.0	29.5	31.5	31.0		29.5
B. Chemical Conditions:												
Total Solids	15.2	20.4	13.2	13.2	19.2	25.6	20.0	21.6	10.8	16.4		23.2
Alkalinity to { Phenolphthalein... Methyl Orange ...	— 0.6	0.7	2.0	2.0	— 0.2	...	— 0.5	— 0.5	— 0.6	— 0.6		— 0.6
P.H.	8.0	8.5	8.8	8.7	8.0	8.5	8.0	8.0	8.0	7.9		8.0
Dissolved oxygen (cc/L)	4.5	5.4	5.4	5.6	5.3	1.2	4.7	6.6	7.2	5.1		5.3
Chlorides	3.1	3.6	3.0	3.7	4.7	4.7	4.5	3.7	4.3	2.1		2.8
Oxygen Absorbed (Tidy's)	0.120	0.144	0.182	0.182	0.315	0.294	0.318	0.231	0.224	0.161		0.210
Ammoniacal Nitrogen	Nil	Nil	Nil	Nil	Tr.	0.064	Nil	Nil	Nil	Nil		Nil
Albuminoid Nitrogen	0.006	0.006	0.016	0.016	0.032	0.032	0.032	0.040	0.032	0.006		0.064
Nitrous Nitrogen	M. Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	Nil	M. Tr.	0.001	Tr.	Tr.		Tr.
Nitric Nitrogen	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil		Nil
Phosphates (Po <sub>4</sub> )	0.001	Nil	Nil	Nil	Nil	0.001	Tr.	0.001	Tr.	Nil		0.001
Silicates (SiO <sub>2</sub> )	0.4	0.3	0.4	0.4	0.4	1.2	0.2	0.3	0.4	0.6		0.1
Total hardness	7.6	6.6	6.0	6.0	6.2	6.0	6.8	9.4	7.2	8.8		10.6
Calcium hardness	3.6	2.8	2.3	2.3	...	...	...	...	...	...		...
Magnesium hardness	3.0	3.8	3.7	3.7	...	...	...	...	...	...		...
Iron	0.001	0.001	0.001	0.001	0.001	0.002	0.020	0.020	0.020	0.020		0.003
C. Bacteriological Conditions:												
B. Coli present in ? c.c. & upds ...	10.0	1.0	5.0	1.0	10.0	0.1	1.0	5.0	1.0	0.1		1.0

\*C = Colourless.

P = Pole green.



Limnological Conditions of the Sources of the City Water Supply: (c) Red Hills Reservoir in 1954

(Results expressed in parts per 100,000)

Description	28-1	26-2	30-3	30-4	26-5	29-6	29-7	30-8	29-9	29-10	29-12
<b>A. Physical Conditions.</b>											
Time (A. M.)	10-30	10-30	10-30	9-30	10-00	10-00	10-20	10-00	9-30	10-0	4-0 (PM)
Colour	C.	S. Y.	S. Y.	Y.	G.	P. Y.	P. Y.	P. Y.	Y.	Y.	C.
Temperature (°C)	29.0	31.0	32.0	33.0	33.0	32.0	28.0	29.0	30.0	30.5	31.0
<b>B. Chemical Conditions.</b>											
Total Solids	22.8	16.0	27.2	27.2	22.8	15.2	12.8	12.8	14.2	16.8	24.0
Alkalinity to { Phenolphthalein	-0.4	-0.5	0.4	-0.5	-0.5	—	0.4	-0.5	-0.5	-0.5	-0.5
{ Methyl Orange	9.0	9.3	9.7	9.6	10.4	—	9.7	10.7	10.0	9.1	10.6
Ph	8.0	8.0	8.4	8.8	8.8	8.8	8.4	7.9	8.0	8.0	8.0
Dissolved Oxygen (cc/L)	3.5	6.0	4.8	3.5	4.9	1.0	5.1	5.9	5.3	5.2	3.9
Chlorides	3.0	3.3	3.3	3.3	3.5	3.9	4.0	3.8	4.3	3.0	2.8
Oxygen Absorbed (Tidy's)	0.152	0.115	0.210	0.210	0.224	0.196	0.259	0.252	0.273	0.147	0.176
Ammoniacal Nitrogen	0.011	Nil	Trace	Trace	Nil	0.006	Nil	Nil	Nil	Nil	Nil
Albuminoid	0.011	0.016	0.040	0.040	0.044	0.032	0.040	0.048	0.018	0.008	0.068
Nitrous	M. Trace	M. Trace	M. Trace	M. Trace	M. Trace	Nil	Nil	Trace	0.001	0.001	0.001
Nitric	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Phosphates (PO <sub>4</sub> )	Nil	Nil	Nil	Nil	Nil	0.001	0.001	0.001	Trace	Nil	0.001
Silicates (SiO <sub>2</sub> )	0.4	0.6	0.5	0.5	0.4	1.0	0.2	0.3	0.4	0.6	0.1
Total hardness	7.0	7.4	7.0	7.8	7.8	7.6	7.0	7.6	7.6	11.8	11.6
Calcium	4.4	4.0	4.2	4.2	—	—	—	—	—	—	—
Magnesium	2.6	3.4	2.8	3.6	—	—	—	—	—	—	—
Iron	0.001	0.001	0.002	0.002	0.005	0.004	0.010	0.006	0.005	0.003	0.002
<b>C. Bacteriological Conditions:</b>											
B. Coli present in ? c.c. & upds?	5.0	5.0	5.0	1.0	5.0	1.0	1.0	5.0	1.0	0.1	1.0



WATER ANALYSIS

TABLE VI

Physico-Chemical and Bacteriological conditions of the Chlorinated Raw Water at the Kilpauk end of the Raw Water Conduits :  
Weekly Averages for 1954. (Results expressed in parts per 100,000)

Description	January					February					March.					April												
	9		16		23		31		6		13		20		27		31		3		10		17		24		30	
	2																											
Colour	...	Y. Tr. .008	Y. Tr. .008	Y. Nil .040	Y. .003	Y. Nil .032	Y. Nil .044	Y. Nil .020	Sl. Y. Nil .036	Sl. Y. Nil .024	Sl. Y. Tr. .032	Sl. Y. Nil .036	Sl. Y. Nil .018	Sl. Y. ...	Sl. Y. Tr. .034	Sl. Y. .002	Sl. Y. .016	Sl. Y. .052										
Ammoniacal N	...	M. Tr. .008	M. Tr. .016	M. Tr. .040	M. Tr. .036	M. Tr. .032	M. Tr. .044	M. Tr. .020	M. Tr. .036	M. Tr. .024	M. Tr. .032	M. Tr. .036	M. Tr. .018	M. Tr. .000	M. Tr. .034	M. Tr. .048	M. Tr. .048	M. Tr. .056										
Albuminoid	...	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil										
Nitrous	...	3.3	3.3	2.9	4.5	3.1	4.0	3.0	3.2	3.7	3.2	3.3	3.1	3.1	3.1	3.4	3.4	3.6										
Nitric	...	.142	.180	.165	.142	.150	.151	.179	.146	.158	.175	.165	.189	.205	.176	.175	.184	.177										
Chlorides	...	8.6	8.0	8.3	8.4	8.4	8.8	8.3	8.2	8.2	8.2	8.2	8.3	8.0	8.8	8.8	8.3											
Oxygen absorbed (Tidy's)	...	...	.4	.2	.3	.3	.7	.3	.4	.4	.4	.4	.4	...	.5	.6	.7	.5										
P. H.	...	...	8.6	8.8	9.0	9.0	9.5	9.9	8.8	8.8	8.3	8.9	9.0	...	9.6	9.8	10.4	9.8										
Alkali-Phenolphthalein	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...										
nity to Methyl orange	...	...	8.4	8.0	8.2	8.2	8.4	7.2	7.0	7.6	7.2	7.6	7.4	...	8.0	7.0	7.4	7.8										
Total hardness	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...										
Phosphates (PO <sub>4</sub> )	...	...	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.003	.003	.001	Tr.	.001										
Silicates (SiO <sub>2</sub> )	...	...	0.6	0.7	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.6	0.6	0.4	0.1	0.1										
Iron	...	...	.002	.002	.002	.002	.001	.001	.001	.002	.002	.001	.001	.001	.001	.001	.002	.002										
%Samples showing no B. Coli in 60 cc.	1.0	33.0	3.3	50.0	50.0	16.0	33.0	0.0	34.0	...	56.0	...	...	0	50.0	.0	.0	.0										

Y = Yellow, Sl. Y. = Slightly Yellowish. M. Tr. = Minute Trace. Tr. = Trace



Physico—Chemical and Bacteriological conditions of the Chlorinated Raw Water at the Kilpauk end of the Raw Water Conduits :  
Weekly Averages for 1954. (Results expressed in parts per 100,000.)

Description	May				June				July				August					
	8	15	21	28	5	12	19	26	3	10	17	23	31	7	14	21	28	31
	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.
Colour	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ammonical Nitrogen	0.002	0.005	0.002	Nil	0.002	0.003	0.002	Nil	...	Nil	0.003	0.004	Nil	0.004	0.004	0.003	0.003	Sl. Y.
Albuminoid	0.036	0.040	0.040	0.044	0.068	0.064	0.060	0.064	...	0.048	0.056	0.048	0.032	0.072	0.068	0.068	0.064	...
Nitrous	Tr.	Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	M. Tr.	Tr.	Tr.	0.001	0.001	0.001	0.001	...
Nitric	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	"	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Chlorides	3.1	3.2	3.4	3.1	4.2	4.1	4.5	4.2	4.4	4.5	5.0	4.3	4.4	4.7	4.8	4.4	4.5	4.6
Oxygen absorbed (Tidy's).	204	190	216	213	226	231	238	226	242	248	229	259	228	243	240	239	211	228
P.H.	7.7	7.8	8.3	8.3	8.8	7.8	7.7	8.0	8.2	8.3	8.2	8.4	8.2	8.3	8.2	8.3	8.2	...
Alkali-phenolphthalein	5	6	8	...	7	8	4	4	4	2	5	3	5	4	3	0.3	4	...
nity to	9.6	9.4	10.0	...	10.3	10.7	10.7	10.6	11.4	11.2	10.6	10.2	10.0	9.6	8.8	9.7	10.5	...
Methyl orange...	7.6	8.0	7.6	7.2	7.6	7.8	7.6	7.0	..	7.0	7.4	7.8	7.6	7.4	7.7	7.3	8.4	...
Total hardness	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phosphates (PO <sub>4</sub> )	Nil	Nil	Tr.	0.001	0.002	0.001	0.001	Tr.	...	Tr.	Tr.	Tr.	Tr.	0.003	0.004	0.01	0.002	0.002
Silicates (SiO <sub>2</sub> )	0.7	0.7	0.8	0.6	0.3	0.1	0.2	0.2	...	0.4	0.2	0.3	0.4	0.8	0.8	0.8	0.8	0.8
Iron	0.01	0.01	0.01	0.001	0.003	0.002	0.002	0.002	...	0.001	0.010	0.010	0.010	0.008	0.002	0.002	Nil	0.002
%Samples showing no. B. Coli in 60 cc.	Nil	4.0	Nil	Nil	25.6	0	0	0	3.0	Nil	Nil	Nil	3.0	Nil	20.0	Nil	33.0	50.0



Physico—Chemical and Bacteriological conditions of the Chlorinated Raw Water at the Kilpauk end of the Raw Water Conduits:  
Weekly Averages for 1954. (Results expressed in parts per 100,000)

Description	September					October					November					December								
	11		17		30	9		16		23	31		6	13		19	27		30	4	11	17	24	31
	4	Sl. Y.	Sl. Y.	Sl. Y.		Sl. Y.	Sl. Y.	Sl. Y.	Sl. Y.		Sl. Y.	Sl. Y.		Sl. Y.	Sl. Y.		Sl. Y.	Sl. Y.						
Colour	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ammoniacal N	Tr.	0.40	0.003	0.004	Nil	Tr.	0.056	Tr.	0.064	Tr.	0.060	Nil	Tr.	0.032	Tr.	0.056	Tr.	0.016	Tr.	0.002	Tr.	0.005	Tr.	0.003
Albuminoid "	0.001	0.001	0.001	0.001	0.048	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	0.001	Tr.	Tr.	Tr.	Tr.	Tr.	0.064	0.052	0.073	0.060	0.076
Nitrous "	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Tr.	Tr.	0.001	0.001	0.001	0.001	0.001
Nitric "	4.4	4.4	4.2	4.2	4.2	4.2	4.2	4.2	3.9	3.9	3.4	3.4	3.3	3.0	3.0	3.2	2.9	2.9	2.9	Nil	Nil	Nil	Nil	Nil
Chlorides	240	237	237	237	226	203	217	219	219	219	176	176	176	160	160	175	164	164	164	141	173	161	142	192
Oxygen absorbed (Tidy's)	8.4	8.2	8.3	8.3	8.2	8.2	8.3	8.4	8.4	8.4	8.3	8.3	8.1	8.3	8.3	8.2	8.4	8.4	8.4	8.4	8.3	8.4	8.4	8.4
P. H.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Alkali-phenolphthalein	6	4	6	6	5	...	7	7	7	7	4	4	5	4	4	3	9	9	9	0.9	0.8	4	9	6
Total hardness	10.2	10.1	10.1	9.6	10.0	...	10.1	10.0	10.0	10.0	8.7	8.7	8.8	8.8	8.8	9.4	10.1	10.5	10.0	10.3	10.3	10.3	9.5	9.8
	7.7	7.5	7.2	7.5	7.1	7.0	7.3	7.1	7.1	7.1	7.2	7.2	8.9	8.7	8.7	9.1	11.0	9.2	12.9	10.3	11.7	12.0	12.0	10.2
Total solids	...	18.0	10.0	...	12.1	...	...	16.0	16.0	16.0	...	...	28.0	21.8	21.8	24.9	...	...	...	28.9	...	...	20.1	24.4
Phosphates (PO <sub>4</sub> )	Tr.	0.001	0.001	0.001	0.001	...	0.001	0.001	0.001	0.001	Tr.	Tr.	0.001	Tr.	Tr.	Tr.	Tr.	Tr.	0.001	0.001	0.002	0.001	0.001	0.001
Silicates (SO <sub>3</sub> )	0.2	0.2	0.2	0.2	0.2	...	0.4	0.4	0.4	0.4	0.6	0.6	0.2	0.4	0.4	0.2	0.2	0.3	0.8	0.4	0.6	0.2	0.1	0.1
Iron	Tr.	0.005	0.010	0.000	0.002	...	0.001	0.001	0.001	0.001	0.008	Tr.	Tr.	0.010	0.010	Tr.	0.010	0.005	0.004	0.002	Tr.	0.005	0.001	0.001
%Samples showing no. B. Coli in 60 cc.	10.0	12.0	8.0	14.0	8.8	100.0	33.0	33.0	33.0	33.0	100	16.0	16.0	10.0	10.0	18.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sl. Y. = Slightly Yellowish. Tr. = Trace. M. Tr. = Minute Trace.



Some Important Physical, Chemical, and Bacteriological Results of Filtrates from Beds in 1954  
(Results expressed in parts per 100,000)

Months 1954	No. of Samples	Colour	Ammoniacal Nitrogen	Albuminoid Nitrogen	Nitrous Nitrogen	Nitric Nitrogen	Chlorides	Oxygen Absorbed Tid's	Alkalinity to		P.H.	Total Hardness	PO <sub>4</sub>	Si O <sub>2</sub>	Fe.	No. of Samples	B. Coli in ? c.c.—%					
									† P.T.H.	‡ M.O.							—60	60	20	10	5	1
January	21	S.Y.H.	·002	·022*	M.Tr.	Nil	3·0	·159	—0·3	8·5	7·9	7·2	·001	0·5	·001	22	13	13	23	36	...	15
February	23	"	·003	·025	"	M.Tr.	2·9	·145	—0·5	8·8	8·1	8·0	·001	0·5	·001	23	9	22	26	39	4	...
March	25	C.C.	·005	·027	"	Tr.	3·3	·156	—0·5	8·8	7·8	7·4	·001	0·6	·001	25	0	0	28	36	24	12
April	23	S.Y.H.	·026	·054	"	Nil	3·4	·209	—0·5	9·5	7·8	7·4	·002	0·3	·002	23	5	18	5	30	21	21
May	25	"	·009	·044	"	"	3·4	·186	—0·8	9·2	8·1	7·5	Tr.	0·8	·002	25	0	4	0	28	48	20
June	23	"	·011	·053	"	"	4·1	·210	—0·5	10·7	7·9	7·7	·001	0·17	·002	24	4	...	4	12	37	43
July	26	"	·018	·044	Tr.	"	4·0	·221	—0·6	10·5	8·0	6·9	Tr.	0·3	·008	25	8	4	12	4	36	36
August	23	"	·013	·060	"	"	4·2	·213	—0·3	9·8	...	7·4	·002	0·8	·003	16	6	18	24	30	22	...
September	24	"	·012	·038	·001	"	4·1	·218	—0·6	10·1	7·8	7·6	·001	0·2	·004	24	4	...	..	...	...	...
October	20	"	·006	·056	Tr.	"	3·8	·187	—0·6	9·5	7·9	7·2	·001	0·4	Tr.	20	...	...	...	100	...	...
November	25	"	Tr.	·019	·001	"	3·0	·146	—0·7	9·3	7·6	9·5	Tr.	0·2	·001	25	4	...	...	96	...	...
December	25	"	·008	·051	·001	Tr.	2·9	·150	—0·7	10·0	8·0	12·3	·001	0·3	·001	25	...	...	...	100	...	...

\* M. Tr.—Minute Trace.

† P.T.H.—Phenolphthelin.

‡ M.O.—Methyl Orange.



Some important Physical, Chemical and Bacteriological Results of the Test Tap Water at K. P. S. in 1954.  
(Results expressed in parts per 100,000.)

Months	No. of Samples	Colour	Ammoniacal Nitrogen	Albuminoid Nitrogen	Nitrous Nitrogen	Nitric Nitrogen	Oxygen Absorbed (Tity's)	Chlorides	Alkalinity to		P.H.	Total hardness	Total Solids	PO <sub>4</sub>	SiO <sub>2</sub>	Fe	%—B. Coli in ? cc. & upds						
									P.T.H.	M.O.							No. Samples	—60	60	20	10	5	
1954																							
January	...	Sly&H	·002	·029	M. Tr.	Nil	·144	2·9	—0·5	8·2	7·9	7·6	12·5	·001	·6	·001	22	96	4	...	...	...	...
February	...	"	·003	·022	"	"	·141	3·0	—0·5	8·5	7·7	7·7	13·7	·001	·5	·001	23	87	4	...	...	...	9
March	...	"	·006	·033	"	M. Tr.	·153	3·4	—0·7	8·7	7·7	7·7	16·2	·001	·5	·001	25	76	20	4	...	...	...
April	...	"	·026	·057	"	Nil	·159	3·4	—0·4	9·2	7·7	7·4	17·3	·002	·2	·002	23	26	65	...	4	...	5
May	...	"	·013	·041	"	"	·181	3·4	—0·8	9·1	7·7	7·4	16·9	Tr.	·7	·002	25	32	56	12	...	...	...
June	...	"	·016	·060	"	"	·203	4·1	—0·5	10·5	7·8	7·4	15·8	·001	·2	·002	24	8	4	8	...	...	80
July	...	"	·014	·047	"	"	·214	4·2	—0·5	10·3	7·7	6·9	15·2	Tr.	·3	·008	90	20	6	16	11	47	
August	...	"	·014	·061	·001	"	·203	4·3	—0·4	9·5	7·7	7·4	14·0	·002	·8	·004	23	30	22	30	30	5	
September	...	"	·009	·038	·001	"	·213	4·4	—0·7	10·0	7·7	7·6	14·3	·001	·2	·004	24	30	...	70	...	...	
October	...	"	·004	·058	Tr.	M. Tr.	·172	4·2	—0·4	9·5	7·7	6·8	22·0	·001	·4	·001	20	15	...	85	...	...	
November	...	"	Tr.	·018	"	"	·138	3·2	—0·6	9·3	7·9	9·7	21·1	Tr.	·3	·004	25	8	...	92	...	...	
December	...	"	·004	·053	"	"	·151	3·0	—0·7	9·8	7·6	11·1	22·0	·001	·3	·001	25	0	...	100	...	...	



Chlorination Data for 1954—Furnished by the Water Works Department

Months.	Quantity of water filtered in million gallons per day			Dose of Chlorine applied to Raw water in P.P.M.			Dose of Chlorine applied to filtered water in P.P.M.			Lbs. of Chlorine used per month for pre-Chlorination of R.W.	Lbs. of Chlorine used per month for post Chlorination of F.W.	Total lbs. of Chlorine used per month	Cost of Chlorine per lb.	Total cost of Chlorine	Total Cost of Chlorine
	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.						
January ...	22.85	20.65	21.60	1.16	0.83	1.02	2.42	1.42	2.13	6875	14287	21162	0 8 0	10,581 0 0	Rs. A. P. 1,43,600 13 0 2,243 0 0 1,45,843 13 0
February ...	23.32	21.66	22.34	1.10	0.94	1.06	2.35	1.49	1.94	6645	12166	18811	"	9,405 8 0	
March ...	23.48	21.40	22.38	1.33	1.02	1.19	1.92	1.39	1.66	8317	11399	19716	"	9,858 0 0	
April ...	22.98	21.66	22.35	1.57	1.25	1.46	1.55	1.25	1.39	9809	9379	19188	0 7 6	8,894 6 0	
May ...	26.66	21.66	23.13	1.99	1.35	1.55	2.05	1.40	1.67	11082	11956	23038	"	10,799 1 0	
June ...	23.32	21.32	22.35	1.99	1.31	1.83	2.51	1.89	2.15	12247	74417	26644	"	12,498 12 0	
July ...	23.65	20.65	22.11	2.21	1.01	1.85	2.91	2.33	2.55	13026	17588	30614	"	14,350 5 0	
August ...	23.98	21.40	22.43	2.20	1.04	1.99	3.36	2.13	2.78	14208	19103	33311	"	15,614 8 6	
September ...	24.05	22.44	23.99	2.36	1.73	1.99	2.79	1.82	2.61	13863	18392	32255	"	15,119 8 6	
October ...	24.32	21.32	23.21	2.52	1.44	1.86	2.92	2.13	2.60	13364	18711	32075	"	15,035 2 6	
November ...	24.32	22.66	23.49	1.87	1.11	1.49	2.75	1.64	2.19	9747	14801	24548	"	11,506 0 0	
December ...	24.16	22.16	23.24	1.43	0.96	1.14	2.42	1.16	1.76	8311	12678	20989	"	9,838 9 6	
														1,43,600 13 0	



Kortalayar River System—City Distribution System—Results of Chemical Examination—1954  
(Results expressed in parts per 100,000)

Months	High pressure areas (near the Head works)										Low pressure areas (out-lying divisions)													
	No. of Samples	Smell	Ammoniacal Nitrogen	Albuminoid Nitrogen	Nitrous N.N.	Nitric N.N.	Chlorides	Oxygen Absorbed	P. H.	Total hardness	Total Solids	Iron	No. of Samples	Smell	Ammoniacal Nitrogen	Albuminoid Nitrogen	Nitrous N.N.	Nitric N.N.	Chlorides	Oxygen Absorbed	P. H.	Total hardness	Total Solids	Iron
January	20	Nil	...	...	Tr	Tr	3	.141	7.5	7.2	16.2	.001	112	Nil	.001	.032	Tr	Tr	3.0	.145	7.5	7.3	15.2	.008
February	12	"	...	...	"	"	3	.140	7.7	7.8	10.8	.001	148	"	.002	.016	"	"	3.4	.134	7.6	8.0	15.0	.005
March	20	"	...	...	"	"	3.5	.143	7.6	7.2	15.0	.018	155	"	.002	.027	"	"	3.4	.145	7.6	7.5	15.1	.005
April	19	"	.004	.052	"	Nil	3.3	.154	7.5	7.4	15.2	.003	137	"	.003	.033	"	Nil	3.5	.158	7.6	7.7	16.4	.004
May	16	"	.004	.029	Pr	Tr	3.8	.169	7.7	7.7	22.2	.002	132	"	.004	.027	"	Tr	3.6	.171	7.7	7.7	17.4	.005
June	12	"	.002	.048	Int	"	4.0	.226	7.6	7.6	27.0	.005	111	"	.014	.054	Pr	"	4.2	.213	7.6	7.6	19.0	.007
July	15	"	.003	.048	Tr	"	4.2	.211	7.6	6.9	16.4	.014	136	"	.012	.054	"	"	4.3	.216	7.6	7.2	13.6	.021
August	20	"	.010	.058	.001	"	4.2	.204	7.5	6.9	10.5	.007	142	"	.011	.056	.001	Nil	4.3	.195	7.6	7.2	14.1	.006
September	26	"	.007	.036	.001	"	4.3	.219	7.7	7.5	24.8	.006	134	"	.004	.048	.001	Tr	4.2	.213	7.6	7.6	14.9	.007
October	10	"	.003	.052	.001	"	4.3	.197	7.7	7.3	24.0	.002	119	"	.003	.050	.001	"	4.2	.181	7.6	7.3	18.1	.003
November	20	"	...	...	.001	"	3.3	.143	7.6	10.3	...	.012	104	"	.002	.035	.001	"	3.4	.137	7.6	9.8	20.0	.016
December	18	"	002	.064	.001	"	3.0	.154	7.6	11.5	20.0	.001	124	"	.003	.039	.001	"	3.1	.134	7.6	10.9	22.6	.003



Kortalayar River System—Distribution System—Results of Bacteriological  
Examination of High Pressure & Low Pressure Areas

Months		High Pressure areas—% B. Coli in							Low Pressure areas—% B. Coli in						
		No. of Samples	—60	60	20	10	5	1	No. of Samples	—60	60	20	10	5	1
January	1954	20	90	10	...	...	...	...	112	68	18	6	4	...	4
February	"	12	...	16	68	16	...	...	148	57	32	2	8	1	...
March	"	20	20	75	5	...	...	...	155	39	46	6	6	1	1
April	"	19	10	74	5	5	6	...	137	13	57	14	9	4	3
May	"	16	...	31	56	13	...	...	130	...	25	27	33	10	5
June	"	12	...	...	8	8	84	...	105	1	3	18	34	32	12
July	"	15	...	...	...	18	23	59	136	...	...	2	12	55	31
August	"	20	10	25	20	25	20	...	142	6	26	22	22	20	4
September	"	26	50	...	...	50	...	...	134	45	...	...	55	...	...
October	"	10	80	...	...	20	...	...	119	29	...	...	71	...	...
November	"	20	40	...	...	60	...	...	104	22	...	...	78	...	...
December	"	18	0	...	...	100	...	...	124	0	...	...	100	...	...

APPENDIX I



## WATER ANALYSIS

## TABLE No. XII

Kortalayar River System—Booster Area—Results of  
Chemical Examination

(Results expressed in parts per 100,000)

Months	No. of Samples	Smell	Ammoniacal Nitrogen	Albuminoid Nitrogen	Nitrous Nitrogen	Nitric Nitrogen	Oxygen Absorbed	P.H.	Total Hardness	Total Solids	Iron
January 1954	10	Nil	·002	·040	Tr	Nil	·152	7·6	7·3	16·0	·005
February „	8	Nil	...	...	Tr	Tr	·131	7·6	8·1	...	·002
March „	10	Nil	·002	·023	Tr	Tr	·143	7·6	7·6	...	·004
April „	10	Nil	·003	·022	Tr	Nil	·155	7·6	7·9	17·3	·006
May „	11	Nil	Tr	·015	Tr	Tr	·167	7·7	7·8	18·8	·004
June „	4	Nil	...	...	Pr	Tr	·196	7·6	8·1	20·8	·004
July „	12	Nil	·006	·032	Tr	Tr	·184	7·6	9·0	21·8	·008
August „	12	Nil	·013	·052	Tr	Nil	·191	7·5	7·4	12·8	·007
September „	14	Nil	·002	·040	·001	Tr	·195	7·7	7·8	15·6	·013
October „	8	Nil	Tr	·057	·001	Tr	·174	7·5	7·1	10·2	·003
November „	6	Nil	Nil	·020	·001	Tr	·133	7·6	10·9	21·2	·023
December „	10	Nil	·002	·023	·001	Tr	·104	7·6	10·9	25·0	·005



WATER ANALYSIS

TABLE No. XIII

Kortalayar River System—Booster Area—Results of Bacteriological Examination, 1954

Months		Number of samples	%—Coliform organisms present in						
			—60 c. c.	60 c. c.	20 c. c.	10 c. c.	5 c. c.	1 c. c.	0.1 c. c.
January	1954	10	90	10	Nil	Nil	Nil	Nil	...
February	„	8	63	12	Nil	25	Nil	Nil	...
March	„	10	39	46	6	6	2	1	...
April	„	10	Nil	40	30	20	10	Nil	...
May	„	11	Nil	Nil	28	36	36	Nil	...
June	„	4	Nil	Nil	Nil	50	50	Nil	...
July	„	12	Nil	Nil	Nil	Nil	50	50	...
August	„	12	17	17	16	25	25	Nil	...
September	„	14	30	...	..	70	..	...	...
October	„	8	Nil	...	...	100	...	...	...
November	„	6	Nil	...	...	100	...	...	...
December	„	10	Nil	...	...	100	...	...	...



(Results expressed in parts per 100,000)

1954		Sembium												Saidapet											
Months		Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Colour	...	C	C	Sy	C	C	C	Sy.	C	Sy.	C	C	C	C	C	C	C	C	C	C	C	C	C		
Ammoniacal Nitrogen	...	Nil	Nil	Nil	0.003	Nil	Nil	0.001	Tr.	Tr.	Tr.	Nil	Tr.	0.001	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil		
Albuminoid Nitrogen	...	Nil	Nil	Nil	0.003	Nil	Nil	Nil	0.003	Nil	0.003	Nil	Tr.	Nil	Tr.	Nil	Nil	Nil	Nil	Tr.	0.002	Tr.	Tr.		
N O <sub>2</sub> —Nitrogen	...	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	0.001	Tr.	Tr.	Tr.	Tr.	Tr.	Nil	Tr.	Tr.	Tr.	Tr.	Tr.	Tr.	0.001	Tr.	Tr.		
N O <sub>3</sub> —Nitrogen	...	Tr.	Tr.	Tr.	Nil	Tr.	Tr.	Tr.	Tr.	Tr.	Pr.	Tr.	Pr.	Pr.	Pr.	Pr.	Pr.	Pr.	Pr.	Pr.	Pr.	Pr.	Int.		
Oxygen Absorbed	...	0.056	0.058	0.063	0.125	0.073	0.072	0.094	0.051	0.018	0.047	0.028	0.084	0.035	0.049	0.060	0.086	0.035	0.063	0.035	0.056	0.015	0.060		
P.T.H. Alkalinity	...	0.05	0.07	0.11	...	0.22	0.15	0.15	0.18	0.17	0.2	...	0.1	0.16	0.12	0.19	...	0.22	...	0.8	0.16	0.17	0.14		
M. O. Alkalinity	...	10.2	8.5	8.2	...	11.0	10.6	8.3	8.0	8.5	7.5	...	13.0	15.7	17.8	16.3	...	15.8	...	16.0	16.1	10.5	11.4		
P. H.	...	8.0	7.1	7.2	...	7.2	7.1	6.9	7.0	6.8	8.0	7.4	7.2	7.3	7.5	7.8	...	7.2	7.4	7.4	7.2	7.4	7.8		
Chlorides	...	16.0	14.0	9.0	...	12.0	13.0	15.0	12.0	9.0	10.0	...	28.0	28.0	25.0	25.5	...	19.0	22.0	21.0	19.0	12.0	8.0		
Total hardness	...	14.0	14.5	10.5	16.5	20.0	15.0	14.5	12.5	23.0	27.0	24.0	26.0	24.0	25.0	26.0	24.0	21.0	23.0	28.0	27.0	20.0	35.0		
Total solids	...	41.2	24.8	30.2	30.8	39.2	48.0	35.0	24.0	32.0	...	56.0	60.8	61.5	70.0	75.8	66.4	55.0	57.2	61.2	70.0	56.0	...		
Iron	...	0.006	0.008	0.012	...	0.030	0.020	0.033	0.013	0.015	0.004	...	0.001	0.003	0.001	0.001	...	...	0.002	0.002	0.002	0.004	Tr.		
B Coli present in 5 c.c. and upwards—%	...	100	100	...	...	...	100	100	100	...	100	100	100	100	100	100	100	100	100	100	100	...	100		



Infiltration Gallery Systems—Distribution System—Results of Chemical Examination in 1954  
(Results expressed in parts per 100,000)

1954	Sembiam												Saidapet													
	Months	Number of samples	Smell	Ammoniacal Nitrogen	Albuminoid Nitrogen	NO <sub>2</sub> Nitrogen	NO <sub>3</sub> Nitrogen	Chlorides	Oxygen Absorbed	P.H.	Total Hardness	Total Solids	Iron	Number of samples	Smell	Ammoniacal Nitrogen	Albuminoid Nitrogen	NO <sub>2</sub> Nitrogen	NO <sub>3</sub> Nitrogen	Chlorides	Oxygen Absorbed	P.H.	Total Hardness	Total Solids	Iron	
January	...	8	Nil.	Nil.	Tr.	Tr.	Tr.	12.7	.077	7.3	13.7	22.4	.022	6	Nil.	Nil.	Nil.	Tr.	Tr.	Pr.	27.6	.044	7.4	27.3	77.2	.019
February	...	16	"	"	.001	"	"	13.0	.062	7.2	14.2	30.2	.220	8	"	"	"	"	"	"	28.0	.032	7.8	30.5	78.4	.025
March	...	8	"	"	Tr.	"	"	13.0	0.66	7.3	12.0	32.4	.021	15	"	Tr.	.010	"	"	"	29.3	0.44	7.9	32.7	83.4	.015
April	...	16	"	Tr.	"	"	"	16.6	.055	7.5	17.1	35.5	.023	6	"	Nil.	Tr.	"	"	"	33.0	.050	7.8	30.0	...	.002
May	...	10	"	...	...	"	"	15.0	.076	7.6	17.6	32.8	.005	18	"	Tr.	"	"	"	Int.	30.9	.078	7.8	30.3	83.0	.005
June	...	8	"	Nil.	Nil.	"	Nil.	...	.058	7.8	18.0	39.2	.260	12	"	"	"	"	"	Pr	...	.071	...	30.3	84.0	...
July	...	10	"	"	"	"	Tr.	19.0	.065	7.9	20.0	52.0	.070	8	"	"	"	"	"	"	28.0	.067	8.1	30.0	60.0	.027
August	...	16	"	Tr.	Tr.	.001	"	27.7	.051	7.5	20.8	46.0	.018	13	"	"	"	.001	"	"	28.3	.068	8.0	28.0	88.0	.008
September	...	9	"	Nil.	"	.001	"	16.2	.057	7.5	18.5	36.0	.046	7	"	Nil.	Nil.	.001	"	"	29.7	.036	8.2	32.7	0.8	.011
October	...	8	"	"	.004	.001	"	17.5	.018	7.5	20.2	28.0	.016	8	"	"	Tr.	Tr.	"	"	27.5	.032	8.2	30.4	96.0	.004
November	...	8	"	"	Nil.	.001	"	10.0	.053	7.1	35.0	...	.042	8	"	"	Nil.	"	"	"	12.5	.026	7.8	21.0	..	.016
December	...	8	"	"	"	Tr.	"	10.7	.042	7.2	42.0	...	.016	8	"	.003	.003	"	"	"	8.0	.030	7.	29.7	..	.014



Infiltration Gallery Wells—Sembiam and Saidapet—Distribution System—Bacteriological Examination, 1954.

Months		Sembiam Distribution System							Saidapet Distribution System									
		Number of samples	%—B. Coli in						Number of samples	%—B. Coli in								
			—60	60	20	10	5	1		.1	—60	60	20	10	5	1	.1	
January 1954	...	8	12	88	...	...	...	...	...	...	...	...	...	...	...	...	...	...
February "	...	16	63	37	...	...	...	...	...	...	...	...	...	...	...	...	...	...
March "	...	8	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
April "	...	16	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
May "	...	10	70	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...
June "	...	8	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
July "	...	10	90	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...
August "	...	16	Nil	87	6	...	...	...	...	...	...	...	...	...	...	...	...	...
September "	...	9	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
October "	...	8	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
November "	...	8	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
December "	...	8	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...



Results of Chemical and Bacteriological Examination of Shallow Wells used as Sources of Water Supply to Outlying Areas in 1954.  
(Results expressed in parts per 100,000)

Description	Richards' Park Well, Saidapet				Urur Well—East, Adyar				Urur Well—West, Adyar				United India Colony Well-Kodambakkam			
	Aug.	Sept.	Oct.	Nov.	Dec.	Aug.	Sept.	Oct.	Nov.	Dec.	Aug.	Sept.	Oct.	Nov.	Dec.	
Colour	...	Sy.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	...	C.	C.	C.
Ammoniacal Nitrogen	...	Nil	Nil	Nil	Nil	0.04	0.04	0.02	Nil	0.03	Nil	0.03	Tr.	0.04	0.160	0.176
Albuminoid Nitrogen	...	0.02	0.02	0.05	Tr.	0.02	0.02	Tr.	Nil	0.03	0.02	0.02	Tr.	0.04	0.160	Nil
NO <sub>2</sub> —Nitrogen	...	Tr.	Tr.	0.05	0.05	0.01	Tr.	Tr.	Tr.	Tr.	0.01	Tr.	Tr.	0.05	0.005	0.005
NO <sub>3</sub> —Nitrogen	...	Int.	Int.	Int.	Int.	Pr.	Nil	Tr.	Tr.	Pr.	Pr.	Nil	Tr.	Pr.	Pr.	Pr.
Oxygen Absorbed	...	0.71	0.85	0.149	0.094	0.114	0.119	0.072	0.062	0.066	0.105	0.060	0.080	0.083	0.135	0.134
P.T.H. Alkalinity	...	...	-7.0	-2.3	-3.4	-3.9	-0.9	-0.2	-1.5	-0.8	-1.2	-1.2	-0.2	-1.2	-6.5	-5.5
MO. Alkalinity	...	...	38.5	38.2	40.4	38.3	10.2	11.5	13.9	10.4	14.8	14.8	15.1	12.4	38.4	37.3
P.H.	...	...	8.0	8.0	8.0	...	8.0	8.0	7.7	7.8	8.1	8.1	8.1	7.8	6.9	7.0
Chlorides	...	...	86.0	94.0	85.0	89.0	3.0	4.5	4.0	2.0	3.0	3.0	5.5	3.0	106.0	93.0
Total Hardness	...	62.0	62.0	74.0	95.0	88.0	15.0	11.5	7.0	...	15.0	10.0	16.5	7.8	76.0	67.0
Total Solids	...	230.0	242.0	262.0	...	272.0	17.2	22.4	28.0	24.0	18.0	16.2	26.8	28.0	246.0	2.04
Iron	...	Nil	Nil	Tr.	0.010	0.001	...	0.015	0.010	0.008	0.015	0.015	0.003	0.010	0.080	0.048
B. Coli in 1 cc. & upds.	...	1.0	60	0.1	-60	1.0	-60.0	-60.0	10	60	-60	-60	20	60	1	1.0

APPENDIX



Summarised Report on the Sterilisation of Water Mains during the year 1954.

Serial No.	Place	Period	Length of pipe line Sterilised in furlongs	Total pounds of chlorine used	Before Sterilisation						After Sterilisation						% of reduction or increase in the Ammoniacal Nitrogen content in the treated samples as compared with that of untreated samples.	% of reduction or increase in the Albuminoid Nitrogen content in the treated samples as compared with that of untreated samples.	% of reduction or increase in the Iron content in the treated samples as compared with that of untreated samples.
					CHEMICAL (Results expressed in parts per 100,000)					Bacteriological	CHEMICAL (Results expressed in parts per 100,000)					Bacteriological			
					Ammoniacal Nitrogen	Albuminoid Nitrogen	Absorbed Oxygen (Tidy's)	Iron	Phosphate		% of First class samples.	Ammoniacal Nitrogen	Albuminoid Nitrogen	Absorbed Oxygen (Tidy's)	Iron				
Main No. 2																			
1	At the Junction of Erabalu Chetty St. and Moore Street.	1-4-54 to 9-4-54 (8 days)	2	112	·003	·060	·153	·049	·002	15	·003	·052	·085	·014	·001	65	Nil	- 15	- 71
2	1st Line Beach Road near Parry & Co.	11-4-54 to 16-4-54 (4 days)	2	56	·003	·044	·154	·048	·002	10	Trace	·016	·144	·664	·001	70	- 100	- 63	+1383
3	1st Line Beach near G.P.O.	18-4-54 to 21-4-54 (4 days)	4	56	..	..	·195	·033	<·001	18	..	...	·132	·042	·001	68	..	..	+27
Main No. 3.																			
4	At Shaft, Kilpauk.	24-4-54 to 26-4-54 (4 days)	1	56	·012	·048	0·178	·016	·002	74	·010	·052	·171	·032	·001	100	- 17	+ 8	+100
5	At Kelly Road near Electric Sub-Station.	27-4-54 to 17-5-54 (18 days)	2	230	·007	·034	·168	·010	·001	85	·007	·036	·139	·042	·001	100	Nil	+ 6	+300
6	Purasawalkam High Road near Kelly's Bus Stand.	18-5-54 to 1-6-54 (12 days)	2	180	·010	·036	·195	·007	Trace	100	Nil	·024	·179	·010	·001	100	- 100	- 33	- 92
7	Gangadereswarar Koil Street.	3-6-54 to 20-6-54 (16 days)	2	210	·013	·060	·206	·010	·002	63	·013	·060	·190	·017	·001	95	Nil	Nil	+ 70
8	Harris Road near Corporation Park, Pudupet.	21-6-54 to 8-7-54 (15 days)	2	210	·005	·060	·231	·018	·002	48	·004	·060	·195	·036	·002	88	- 20	Nil	+100
9	Triplicane Police Station on Wallajah Road.	12-7-54 to 5-8-54 (20 days)	2	280	·005	·040	·227	·070	·001	39	·005	·040	·190	·123	·002	58	Nil	Nil	+ 76
10	Triplicane High Road near Star Talkies.	6-8-54 to 23-8-54 (13 days)	3	182	·013	·060	·010	·014	·002	18	·010	·060	·206	·030	·220 (?)	81	- 23	Nil	+ 2100
11	Triplicane High Road near Venkateswara Hostel.	24-8-54 to 12-9-54 (11 days)	3	154	·011	060	·200	·013	·001	26	·010	·060	·216	·015	·002	78	- 9	Nil	+ 15
12	Burial Ground Barber's Bridge Road.	13-9-54 to 11-10-54 (21 days)	2	294	·003	·040	·213	·003	·001	11	·003	·032	·210	·010	·001	62	Nil	- 20	+ 25



## Summarised Report on the Sterilisation of Water Mains during the year 1954.

Serial No.	Place	Period	Length of pipe line Sterilised in furlongs	Total pounds of chlorine used	Before Sterilisation						After Sterilisation						% of reduction or increase in the Ammoniacal Nitrogen content in the treated samples as compared with that of untreated samples.	% of reduction or increase in the Albuminoid Nitrogen content in the treated samples as compared with that of untreated samples.	% of reduction or increase in the Iron content in the treated samples as compared with that of untreated samples.
					CHEMICAL (Results expressed in parts per 100,000)					Bacteriological	CHEMICAL (Results expressed in parts per 100,000)					Bacteriological			
					Ammoniacal Nitrogen	Albuminoid Nitrogen	Absorbed Oxygen (Tidy's)	Iron	Phosphate		% of First class samples.	Ammoniacal Nitrogen	Albuminoid Nitrogen	Absorbed Oxygen (Tidy's)	Iron				
13	Lloyds Road near its Junction with Royapetah High Road.	12-10 54 to 9-11-54 (21 days)	3	294	·002	·046	·180	·009	·001	26	·001	·046	·176	·009	·001	81	-50	Nil	Nil
14	Lloyds Road near its Junction with Mowbrays Road.	10-11-54 to 24-11-54 (13 days)	4	182	Trace	·040	·158	·025	·001	31	·001	·040	·134	·045	·024	82	Nil	Nil	+80
15	Junction of Mowbray's Road Edward Elliot Road.	25-11-54 to 14-12-54 (16 days)	2	224	·005	·060	·121	·004	·001	18	·003	·060	·104	·067	·001	69	-40	Nil	+1575
16	At the Junction of Mowbray's Road and Sir C. V. Raman Road.	15-12-54 to 17-1-54 (23 days)	1 mile	322	·006	·036	·153	·030	·001	...	·005	·036	·131	·072	·001	63	-16	Nil	+140
17	At the Junction of St. Mary's Road and Mowbray's Road.	18-1-55 to 6-2-55 (14 days)	2	318	·002	·010	·141	·016	·001	12	·002	·008	·133	·012	·001	89	Nil	-20	-25
18	St. Mary's Road near Corporation School.	7-2-55 to 21-2-55 (12 days)	3	168	·003	·024	·139	·016	·001	29	·005	·020	·126	·640	·001	98	+60	-17	+4100
19	St. Mary's Road near the cemetery.	22-2-55 to 22-3-55 (25 days)	1 mile	350	·003	·042	0·139	·040	·001	23	·003	·040	·065	·120	·001	69	Nil	-5	+200
20	Mada Church Road at the junction of St. Thome High Road.	23-3-55 to 31-3-55 (5 days)	2	70	·002	·016	·121	·030	Trace.	11	·002	·016	·107	·030	·001	56	Nil	Nil	Nil



## CHILD WELFARE

## STATEMENT No I.

Showing the number of cases of labour which came under the care and observation of C.W.S. in 1954

Serial Number	Centre	How Conducted					Caste		Remarks	
		By Nurses of C.W.S.	Taken to Hospital	Taken over after Barber Women Conducted	Maternity Ward	Total	Non-Muslims	Muslims	Twins	Still Births
1	Tondiarpet ...	220	79	22	957	1278	1238	40	14	36
2	Royapuram ...	418	9	12	...	439	293	146	4	7
3	Palmyrah Kuppam	192	13	4	...	209	157	52	1	4
4	Washermanpet ...	697	78	23	1369	2167	1717	450	22	59
5	Sanjeeviroyanpet.	323	60	...	1216	1599	1534	65	14	32
6	George Town ...	352	43	3	728	1126	1019	107	9	31
7	Kothwal Bazaar...	324	38	1	687	1050	829	221	15	22
8	Treveleyen Basin.	369	65	5	854	1293	1289	4	13	26
9	Peddunaickenpet.	230	8	2	...	240	238	2	3	3
10	Muthialpet ...	618	11	9	...	638	470	168	2	16
11	Park Town ...	214	22	3	...	239	237	2	3	14
12	Periamet ...	233	12	2	...	247	188	59	5	6
13	Maternity Home, Choolai ...	432	123	7	1522	2084	2043	41	12	56
14	Purasawalkam ...	545	45	25	838	1456	1409	47	12	35
15	Pulianthope ...	695	109	45	1061	1910	1525	385	18	55
16	Kilpauk ...	161	43	11	348	563	508	55	3	10
17	North Perambur.	459	73	22	415	969	851	118	2	25
18	Nammalvarpet ...	192	11	3	...	206	203	3	2	5
19	Sembiam ...	563	100	4	576	1243	1156	87	14	40
20	Ayanavaram ...	532	46	16	...	594	563	31	4	25
21	Vyasarpadi ...	58	15	2	124	199	196	3	...	6
22	Napier Park ...	236	8	2	...	246	216	30	1	7
23	Egmore ...	378	15	...	...	393	281	112	1	11
24	Chetpet ...	210	29	11	432	682	667	15	5	17
25	Kodambakkam ...	222	59	7	666	954	927	27	6	29
26	Saidapet ...	318	185	11	1393	1907	1838	69	9	54
27	Triplicane ...	667	83	7	907	1664	1127	537	11	35
28	Mirsahibpet ...	661	24	6	...	691	395	296	2	17
29	Mylapore ...	604	21	...	...	625	540	85	4	17
30	Mandavalli ...	400	8	2	...	410	402	8	3	9
31	Royapetah ...	427	26	9	...	462	387	75	4	9
32	Adyar ...	159	15	8	312	494	490	4	3	5
33	Thyagarayanagar.	390	12	4	...	406	398	8	7	12
34	Teynampet ...	486	37	3	...	526	511	15	5	14
Total ...		12985	1525	291	14405	29209	25842	3367	233	732



## CHILD WELFARE

## STATEMENT No. II

Showing the number of visits paid by the Staff of Child-Welfare Scheme in 1954

No.	Centre.	Visits paid by			Total.
		Midwives.	Health Visitors.	Assistant Surgeons.	
1	Tondiarpet ...	7738	4993	836	13567
2	Royapuram ...	5632	5960	148	11740
3	Palmyrah Kuppam ...	4059	4697	204	8960
4	Washermanpet ...	13252	4892	821	18965
5	Sanjiviroyanpet ...	9352	5050	939	15331
6	George Town ...	7427	4805	1038	13270
7	Kothwal Bazaar ...	5608	2860	659	9127
8	Treveleyen Basin ...	8795	4230	274	13299
9	Peddunaickenpet ...	2770	1907	195	4872
10	Muthialpet ...	8154	4165	259	12578
11	Park Town ...	3219	4069	172	7460
12	Periamet ...	5344	4362	99	9805
13	Maternity Home, Choolai ...	17884	9578	989	28451
14	Purasawalkam ...	11161	5756	769	17686
15	Pulianthope ...	12676	7375	603	20654
16	Kilpauk ...	4554	4018	850	9422
17	North Perambur ...	7570	4025	753	12348
18	Nammalvarpet ...	3572	3921	116	7609
19	Sembiam ...	8274	2723	534	11531
20	Ayanavaram ...	5855	6993	127	12975
21	Vyasarpadi ....	1479	958	41	2478
22	Napier Park ...	3006	2744	159	5909
23	Egmore ...	5179	3158	130	8467
24	Chetpet ...	5648	3407	1069	10124
25	Kodambakkam ...	5549	4536	935	11020
26	Saidapet ...	10197	9395	859	20451
27	Triplicane ...	12302	11881	1766	25949
28	Mirsahibpet ...	9719	6289	200	16208
29	Mylapore ...	6328	5555	200	12083
30	Mandavalli ...	5551	4634	187	10372
31	Royapettah ...	5104	3041	342	8487
32	Adyar ...	4595	5196	1185	10976
33	Thyagarayanagar ...	3907	2822	179	6908
34	Teynampet ...	4736	3200	155	8091
Total ...		236196	163195	17792	418145



## CHILD WELFARE

## STATEMENT No. III

Showing the number of Pre-natal cases registered and the number of Booked Cases in 1954

No.	Centre.	No. of Pre-natal cases registered.	No. of Booked cases which attended the Ante-natal clinic	Cases not confined but brought over to account in the next year.
1	Tondiarpet ...	1,438	1,390	269
2	Royapuram ...	1,393	1,177	134
3	Palmyrah Kuppam ...	880	623	94
4	Washermanpet ...	2,731	2,532	195
5	Sanjiviroyanpet ...	1,521	1,505	190
6	George Town ...	1,544	1,540	200
7	Kothwal Bazaar ...	1,030	1,023	72
8	Treveleyen Basin ...	1,826	1,491	80
9	Peddunaickenpet ...	535	519	76
10	Muthialpet ...	1,341	1,294	97
11	Park Town ...	563	528	53
12	Periamet ...	841	829	105
13	Maternity Home, Choolai.	2,287	2,287	295
14	Purasawalkam ...	1,784	1,784	170
15	Pulianthope ...	2,545	2,042	380
16	Kilpauk ...	897	722	60
17	North Perambur ...	1,426	1,416	52
18	Nammalwarpet ...	469	467	65
19	Sembiam ...	1,447	1,382	...
20	Ayanavaram ...	971	969	89
21	Vyasarpadi ...	279	276	36
22	Napier Park ...	696	661	112
23	Egmore ...	982	937	88
24	Chetpet ...	1,002	976	...
25	Kodambakkam ...	1,007	996	147
26	Saidapet ...	2,060	2,060	307
27	Triplicane ...	2,022	2,003	140
28	Mirsahibpet ...	1,367	1,351	197
29	Mylapore ...	1,182	1,182	90
30	Mandavalli ...	851	837	90
31	Royapettah ...	1,005	996	153
32	Adyar ...	611	591	56
33	Thyagarayanagar ...	689	685	51
34	Teynampet ...	951	920	81
Total ...		42,173	39,991	4,224



## CHILD WELFARE

## STATEMENT No. IV

Showing deaths among cases came under the treatment of Child Welfare Scheme, Private Doctors, etc., during the year 1954.

No.	Centre	Deaths among cases brought under care of C.W.S. but not under treatment			Deaths among cases brought under care and treatment of C.W.S.	Total
		Under Private Doctor	Under Vidiants treatment	In Hospital		
1	Tondiarpet	...	...	1	...	1
2	Royapuram	...	...	...	...	...
3	Palmyrah Kuppam	...	...	...	...	...
4	Washermanpet	...	...	7	...	7
5	Sanjiviroyanpet	...	...	1	...	1
6	George Town	...	...	3	...	3
7	Kothwal Bazaar	...	...	1	...	1
8	Treveleyen Basin	...	...	...	...	...
9	Peddunaickenpet	...	...	...	...	...
10	Muthialpet	...	...	...	...	...
11	Park Town	...	...	1	...	1
12	Periamet	...	...	...	...	...
13	Maternity Home, Choolai	...	...	3	...	3
14	Purasawalkam	...	...	3	...	3
15	Pulianthope	...	...	5	...	5
16	Kilpauk	...	...	1	...	1
17	North Perambur	...	...	...	...	...
18	Nammalwarpet	...	...	...	...	...
19	Sembiam	...	...	...	...	...
20	Ayanavaram	...	...	1	...	1
21	Vyasarpadi	...	...	...	...	...
22	Napier Park	...	...	...	...	...
23	Egmore	...	...	1	...	1
24	Chetpet	...	...	1	...	1
25	Kodambakkam	...	...	...	...	...
26	Saidapet	...	...	3	...	3
27	Triplicane	...	...	1	...	1
28	Mirsahibpet	...	...	...	...	...
29	Mylapore	...	1	...	...	1
30	Mandavalli	...	...	...	...	...
31	Royapettah	...	...	...	...	...
32	Adyar	...	...	1	...	1
33	T. Nagar	1	...	1	...	2
34	Teynampet	...	...	...	...	...
Total		1	1	35	...	37



Showing Pre-natal Cases Registered and Ailments of Pregnancy Diagnosed and Patients Advised in 1954

Serial Number	Centre	Cardio—Vascular diseases			Respiratory diseases				Alimentary tract diseases				Diseases of Urinary Tract				Toxaemia or Pregnancy				Deficiency diseases			Pyrexia			Debility	Specific diseases				Other diseases & abnormalities of pregnancy					Normal	Other diseases	Total
		Valvular diseases of the Heart (V.D.H.)	Hypertension	Vericose Veins	Bronchitis	Pneumonia	Pulmonary Tuberculosis	Asthma	Constipation	Dyspepsia	Diarrhoea	Dysentery	Scanty Micturition & Retention of Urine	Albuminuria	Pyelitis	Pre Eclamptic Toxaemia	Eclampsia	Acute yellow atrophy of the liver (Jaundice)	General Anasarca	Calcium deficiency	Vitamin deficiency	Other Nutritional deficiency	Influenza	Malaria	Rheumatism	General debility (Emaciation)	Skin diseases	Ear, Nose, Throat	V.D., Syphilis Gonorrhoea	Leucorrhoea	Morning Sickness	Anaemia	Hydramnios	Ante-partum Haemorrhage	Breast abscess				
1	Tondiarpet ...	6	2	...	6	...	...	1	34	29	8	12	22	29	...	32	...	...	...	22	143	...	53	3	2	49	14	2	4	...	...	272	...	...	1	628	16	1390	
2	Royapuram ...	2	...	1	47	...	...	...	21	...	11	6	104	...	...	11	...	...	...	2	39	...	3	5	...	41	6	1	...	7	..	240	4	...	..	481	147	1179	
3	Palmyrahkuppam.	1	...	1	6	...	...	...	43	10	2	4	14	5	...	2	...	...	...	10	29	...	1	...	...	8	2	...	2	3	30	191	...	1	1	238	19	623	
4	Washermanpet ...	2	48	3	62	2	1	12	102	214	31	38	43	26	2	32	14	...	14	62	96	7	13	15	1	90	24	12	153	10	58	250	4	17	4	925	145	2532	
5	Sanjivirayanpet ...	2	20	...	65	3	1	10	60	...	65	28	25	35	...	18	10	...	12	29	53	28	12	2	...	18	12	...	...	5	4	408	4	4	...	394	178	1505	
6	George Town ...	2	..	5	39	2	...	3	25	53	6	33	...	23	...	3	...	...	5	35	55	...	56	24	10	45	5	3	3	...	9	142	2	4	1	375	572	1540	
7	Kothwal Bazaar ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	72	...	77	...	...	...	...	...	...	...	...	...	...	...	168	...	...	...	514	192	1023	
8	Trevelyan Basin	1	6	...	47	2	...	2	10	47	36	8	5	4	...	10	...	...	...	19	147	115	5	...	...	...	...	...	...	...	344	...	...	...	474	219	1491		
9	Peddunaickenpet.	...	2	1	44	...	...	2	22	51	52	22	24	2	1	4	...	...	2	6	52	22	15	16	2	4	12	9	...	10	42	37	1	1	1	44	16	519	
10	Muthialpet ...	6	...	4	23	2	...	5	50	69	51	42	43	20	...	12	...	...	24	28	35	14	23	20	6	18	17	...	1	2	25	90	4	...	2	619	29	1294	
11	Park Town ...	1	2	2	18	2	1	4	36	60	20	22	40	5	2	6	...	...	16	18	38	20	18	15	20	2	22	6	1	4	25	30	1	1	2	40	28	528	
12	Periamet ...	3	...	...	20	...	...	...	561	15	3	...	2	8	...	...	...	...	...	9	...	5	...	...	10	6	...	2	...	...	...	73	...	...	...	62	50	829	
13	Maternity Home, Choolai	9	35	4	121	...	7	9	185	36	19	9	88	3	...	120	...	...	81	...	128	...	17	..	1	56	4	...	105	15	2	258	18	2	..	757	198	2287	
14	Purasawalkam ...	...	2	...	60	...	...	3	336	647	53	46	250	...	...	7	...	...	1	29	2	..	14	6	...	25	22	...	5	2	...	33	...	...	...	188	53	1784	
15	Pulianthope ...	18	24	...	60	...	5	10	40	60	44	25	43	5	1	10	3	2	13	9	112	...	17	...	5	126	20	...	4	4	4	284	2	3	...	912	177	2042	
16	Kilpauk ...	6	..	5	46	1	...	2	84	61	7	10	37	8	...	8	1	2	...	8	13	14	...	2	1	84	5	4	...	5	...	53	...	...	3	212	40	722	
17	North Perambur.	...	...	4	90	...	...	7	69	123	4	5	33	5	2	...	1	...	22	20	90	20	7	..	...	43	...	...	...	...	...	223	..	...	...	452	196	1416	
18	Nammalwarpet ...	...	...	...	29	...	...	1	55	113	1	4	79	...	...	...	...	...	...	...	25	1	2	...	...	5	2	3	2	4	...	46	...	...	...	78	17	467	
19	Sembiam ...	3	...	4	48	...	...	...	95	...	23	...	106	...	...	9	...	...	...	83	110	9	5	..	...	65	..	...	...	8	...	44	...	...	...	214	556	1382	
20	Ayanavaram ...	1	1	1	9	...	...	2	66	65	7	5	78	19	...	1	...	...	3	6	27	17	3	2	...	68	3	...	...	2	...	28	3	...	1	337	214	969	
21	Vyasarpadi ...	1	...	2	30	...	1	...	16	6	6	2	10	2	...	...	...	...	...	14	25	...	...	...	...	19	1	...	..	3	1	18	...	1	...	54	64	276	
22	Napier Park ...	...	1	...	24	...	1	1	353	4	5	4	13	1	...	...	...	...	2	...	24	...	4	1	...	24	6	...	1	1	123	...	...	...	...	21	47	661	
23	Egmore ...	2	...	...	24	...	...	...	575	20	16	5	10	3	...	...	...	...	8	...	15	..	3	2	...	14	2	1	5	2	...	109	1	2	...	80	38	937	
24	Chetpet ...	...	...	...	12	...	1	1	39	11	...	5	47	118	...	7	5	...	...	17	30	25	1	...	...	86	...	...	...	...	...	70	...	...	...	339	162	976	
25	Kodambakkam ...	...	...	...	22	...	...	...	75	85	4	4	16	...	...	5	...	...	...	...	66	...	..	...	...	14	1	...	...	8	...	153	...	...	...	410	133	996	
26	Saidapet ...	...	...	1	4	2	...	1	50	51	...	14	4	4	...	3	...	...	...	...	104	...	3	...	...	50	2	...	...	...	...	196	...	...	...	1371	200	2060	
27	Triplicane ...	3	20	3	97	...	...	1	...	276	5	6	119	22	...	1	...	...	...	...	223	...	37	...	...	137	9	...	50	2	...	183	...	...	...	570	239	2003	
28	Mirsaibpet ...	4	...	...	44	...	2	3	...	101	12	11	...	...	1	19	...	...	...	...	364	5	39	...	...	17	...	...	4	...	...	265	...	...	...	460	...	1351	
29	Mylapore ...	9	...	2	73	...	3	16	...	112	16	12	...	1	16	19	2	...	4	...	188	38	28	...	12	21	23	..	22	22	..	148	...	...	2	393	...	1182	
30	Mandavelli ...	3	...	...	12	...	1	...	...	61	12	8	...	...	3	4	...	...	...	...	282	...	15	...	...	...	8	4	11	2	..	119	...	1	..	11	280	837	
31	Royapettah ...	...	...	1	37	...	...	...	...	35	3	6	112	...	...	10	...	...	...	...	21	...	5	...	...	83	1	..	3	1	..	152	...	1	2	394	129	996	
32	Adyar ...	10	...	1	4	...	1	...	14	8	2	1	21	...	...	8	...	...	...	...	115	...	3	...	...	...	3	...	..	1	2	220	...	...	...	166	11	591	
33	Thyagarayanagar.	...	...	..	14	...	...	1	70	13	5	4	94	...	...	6	...	...	...	...	16	..	...	...	...	41	1	...	...	...	...	93	...	...	...	203	124	685	
34	Teynampet ...	...	...	...	25	...	1	...	116	13	1	9	159	...	...	8	...	...	...	...	41	4	...	...	...	68	...	...	...	...	...	105	...	...	...	261	109	920	
		95	163	45	1267	16	26	97	3202	249	520	410	1641	348	28	375	36	4	279	417	279	339	412	113	60	1331	233	45	378	123	325	5045	44	38	20	12677	4598	39993	



## Showing Maternal Morbidity (Puerperal) in the year 1954.

No.	Centres	Normal Pregnancy										Diseases of Pregnancy	Ante-Partum complications (before delivery)					Intra and Post Partum complications							Complications during puerperium																	
		Respiratory diseases				Other diseases							Pre-Eclampsia	Eclampsia	Hyperemesis	Acute Yellow atro- phy of the Liver (Jaundice)	Accidental morrhage	Placenta Praevia	Anaemia	Abnormal Presenta- tion	Hydati form mole	Ectopic Gestation	Placenta Praevia	Retained Placenta	Post Partum Hae- morrhage	Anatomical Abnor- mality contracted Pelvis	Malposition and Disproportion	Tardious Labour delayed 2nd Stage	Perineal & Cervical Lacerations	Urinary Complica- tions	Puerperal Sepsis	Phlebitis, Throm- bosis.	Pyrexia	Uterine disorders	Puerperal Toxaemias	Anaemia	Psychosis	Disorders of lacta- tion	Other diseases	Total		
		Bronchitis	Pneumonias	Pulmonary Tuber- culosis	Asthma	Extreme Debility	Veneral diseases	Heart diseases	Pyrexias	Infectious	Skin diseases																														Deficiency diseases	Gastro-Intestinal disorders.
1	Tondiarpet	...	6...	1	1	26	1...	4...	1	8	10	14	5	1	1	6	...	162	27	...	...	...	3	33	...	...	30	110	1	16	...	66	15	...	10	1	21	35	615			
2	Royapuram	...	10	2	1...	...	...	20...	7	12	22	2	...	1	...	...	15	...	...	...	...	...	2	...	...	...	9	20	...	...	...	6	...	5	...	...	...	30	164			
3	Palmyrahkuppam	...	6	...	...	10	...	6	...	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	...	...	8	...	2	...	6	...	...	...	...	...	36	77				
4	Washermanpet	...	25	4	6	12	65	4	8	39	7	24	5	67	21	4	13	9	...	1	63	12	...	...	1	1	24	4	4	25	52	18	17	2	48	...	63	...	22	718		
5	Sanjeviroyenpet	...	10	...	...	1	69	...	1	38	...	16	116	68	34	2	...	1	...	...	72	11	...	...	33	...	...	114	50	9	28	...	34	...	...	...	...	44	751			
6	George Town	...	15	...	...	3	27	5	1	25	3	12	31	18	6	3	4	1	5	...	66	5	...	...	3	...	9	1	...	20	55	9	2	...	13	...	...	35	...	19	396	
7	Kothwal Bazaar	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	6	...	...	...	...	40	...	...	203	250				
8	Trevelyan Basin	...	10	4	...	2	1	...	9	...	10	30	8	13	6	1	...	6	...	6	6	...	...	3	7	...	...	...	...	...	5	...	6	...	32	...	...	6	171			
9	Peddunaickenpet	...	13	2	1	...	...	...	22	...	7	15	20	2	...	1	...	...	...	6	...	...	...	2	...	2	5	7	...	3	...	3	...	1	8	...	...	2	122			
10	Muthialpet	...	5	...	...	3	11	...	2	...	1	3	...	...	...	4	...	...	2	5	...	...	...	2	2	...	...	4	26	3	...	4	...	...	14	...	...	4	97			
11	Park Town	...	8	2	...	1	4	...	...	10	3	6	10	8	6	...	1	...	1	1	1	2	...	...	1	...	2	...	1	8	6	4	4	...	5	1	...	6	...	...	5	107
12	Periamet	...	...	...	...	2	...	...	4	...	...	...	...	...	1	1	...	...	...	20	...	...	...	...	...	...	...	1	11	...	...	...	16	3	1	31	...	22	...	113		
13	Maternity Home, Choolai	...	9	...	4	2	32	...	1	...	1	6	...	16	23	8	...	9	...	...	3	10	...	...	5	21	...	6	60	117	2	20	...	31	46	...	42	...	...	36	510	
14	Purasawalkam	...	22	...	...	3	4	...	...	...	20	19	...	3	...	...	3	...	3	...	...	...	...	...	...	...	...	30	13	38	9	...	31	...	...	42	...	...	58	298		
15	Pulianthope	...	47	...	...	11	96	155	16	6	...	15	178	233	23	1	...	3	18	...	18	...	...	1	5	28	3	...	53	30	...	12	...	12	...	8	12	...	...	12	996	
16	Kilpauk	...	16	1	...	5	13	1	3	2	1	6	13	33	2	...	1	2	7	2	19	1	...	...	4	4	4	10	...	2	...	...	2	1	1	2	...	...	7	165		
17	North Perambur	...	4	...	1	...	5	...	1	8	...	2	6	...	2	1	...	...	8	2	...	...	...	4	1	1	16	30	2	5	...	4	...	2	4	...	...	12	122			
18	Nammalwarpet	...	9	...	...	...	...	...	4	...	2	7	...	...	...	...	...	1	...	6	...	...	...	2	...	1	7	2	6	...	...	3	...	...	4	...	4	...	1	...	55	
19	Sembiam	...	20	12	4	11	28	9	2	35	15	10	26	28	9	...	13	...	1	38	52	...	...	9	4	16	7	15	22	21	20	...	20	18	16	29	...	9	63	532		
20	Ayanavaram	...	4	...	...	2	27	...	1	16	...	4	...	4	...	...	3	...	2	...	22	7	...	...	1	2	1	...	8	4	4	...	12	...	...	11	...	...	82	217		
21	Vyasarpadi	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	1	...	...	...	...	...	...	...	6	8	1	...	10	...	...	...	...	1	...	3	33			
22	Napier Park	...	11	...	...	1	2	...	10	...	2	10	...	...	...	...	...	20	...	...	...	...	...	2	...	...	7	8	...	...	12	1	...	16	...	...	9	111				
23	Egmore	...	8	...	...	2	20	1	...	13	...	2	24	13	...	1	1	...	...	25	...	...	...	1	1	...	2	4	1	4	...	21	...	...	25	...	5	9	184			
24	Chetpet	...	...	...	2	...	4	...	1	2	1	3	6	...	3	...	...	...	1	...	6	7	...	...	...	4	7	8	2	2	3	...	3	...	...	2	...	...	10	77		
25	Kodambakkam	...	...	...	...	1	1	...	4	...	1	2	...	7	2	...	...	2	21	1	...	...	...	2	1	...	36	11	...	7	...	4	8	2	15	...	...	...	...	128		
26	Saidapet	...	...	4	2	...	4	...	1	66	...	4	75	2	18	2	...	...	14	...	...	22	...	...	10	24	3	...	74	89	...	3	...	...	...	...	...	1	418			
27	Triplicane	...	1	...	...	1	6	36	1	1	...	6	1	8	4	...	1	6	...	9	10	...	...	6	13	...	...	47	37	...	4	...	58	...	1	28	1	6	13	305		
28	Mirsaibpet	...	2	...	...	3	...	...	14	...	...	49	...	1	...	...	...	...	32	...	...	...	...	...	...	...	15	3	1	...	...	16	4	...	30	...	...	29	199			
29	Mylapore	...	8	...	...	5	3	...	1	5	...	3	...	...	1	...	...	...	11	...	...	...	...	...	...	...	7	6	...	...	...	...	1	...	...	...	...	...	51			
30	Mandavalli	...	1	...	...	...	5	...	...	5	...	1	10	1	1	...	...	...	8	...	...	...	...	3	2	...	...	1	7	8	...	...	...	...	...	...	...	...	53			
31	Royapettah	...	3	...	...	...	10	1	...	6	...	2	4	1	...	...	...	9	...	...	...	...	...	3	...	...	3	6	1	...	...	3	...	21	...	...	18	93				
32	Adyar	...	...	...	...	...	...	2	2	...	...	...	...	...	2	...	...	...	1	...	...	...	...	9	...	...	7	11	...	...	3	1	...	2	...	...	3	43				
33	T. Nagar	...	10	...	...	...	...	...	4	9	...	...	...	...	1	...	21	2	...	...	...	...	...	1	2	...	...	7	3	18	...	3	...	...	...	...	...	...	81			
34	Teynampet	...	11	...	...	1	1	...	1	...	6	2	...	11	...	...	1	...	19	1	...	...	...	...	...	...	25	6	27	1	...	1	...	...	...	...	...	...	114			
Total		...	294	31	22	70	476	214	51	370	31	177	723	553	212	42	45	30	73	11	708	187	...	...	6	51	238	38	36	676	754	181	159	2	456	99	38	524	3	64	771	8416



No.	Centre	Cardio-vascular diseases of Heart			Respiratory diseases		Alimentary diseases			Urinary Tract diseases		Toxæmias				Haemorrhage						Shock					Infectious diseases					Puerperal Sepsis		Total
		Valvular dis-eases of Heart	Heart failure	Anæmia	Pneumonia	Tuberculosis	Tubercular Enteritis	Dysentery	Intestinal Obstruction	Renal Failure	Pre-eclamptic Toxæmonia	Cholaemia	Cerebral Thrombosis	Eclampsia	Accidental Haemorrhage	Placenta Praevia	Intra & Post Partum Haemorrhage	Retained Placenta	Obstetric Shock	Shock due to Internal Manipulation	Post operative Shock	Ruptured Uterus	Tetanus	Meningitis	Other Fevers	Small-pox Measles etc.	Puerperal Sepsis							
1	Tondiarpet	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
2	Royapuram	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
3	Palmyrah Kuppam.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..		
4	Washermanpet	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..		
5	Sanjiviroyanpet	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7		
6	George Town	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
7	Kothawal Bazaar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3		
8	Treveyen Basin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
9	Peddunaickenpet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
10	Muthialpet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
11	Park Town	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
12	Periamet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
13	M. H., Choolai	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
14	Purasawalkam	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	2	..	3		
15	Pulianthope	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	3		
16	Kilpauk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3		
17	North Perambur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	5		
18	Nammalwarpet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
19	Sembiam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
20	Ayanavaram	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1		
21	Vyasarpadi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
22	Napier Park	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
23	Egmore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
24	Chetpet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
25	Kodambakkam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
26	Saidapet	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3		
27	Triplicane	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1		
28	Mirsaibipet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
29	Mylapore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
30	Mandavalli	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
31	Royapettah	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
32	Adyar	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1		
33	Thyagarayanagar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2		
34	Teynampet	1	..	2	..	..	1	..	..	..	..	..	2	4	..	..	6	7	..	3	2	..	1	1	1	..	..	..	..	..	..	37		



## CHILD WELFARE

## STATEMENT No. VIII

Showing the total number of Priority milk consumers  
from 1st January to 31st December 1954

No.	Centre	Expectant Mothers	Nursing Mothers	Infants	Toddlers	Total
1	Tondiarpet	...	...	117	...	117
2	Royapuram	...	...	68	...	68
3	Palmyrah Kuppam	...	...	82	...	82
4	Washermanpet	...	...	230	...	230
5	Sanjiviroyanpet	...	...	135	...	135
6	George Town	...	...	113	...	113
7	Kothwal Bazaar	...	...	119	...	119
8	Treveleyen Basin	...	...	89	...	89
9	Peddunaickenpet	...	...	...	...	...
10	Muthialpet	...	...	80	...	80
11	Park Town	...	...	92	...	92
12	Periamet	...	...	87	...	87
13	Maternity Home, Choolai...	...	...	105	...	105
14	Purasawalkam	...	...	86	...	86
15	Pulianthope	...	...	62	...	62
16	Kilpauk	...	...	73	...	73
17	North Perambur	...	...	79	...	79
18	Nammalwarpet	...	...	...	...	...
19	Sembiam	...	...	38	...	38
20	Ayanavaram	...	...	...	...	...
21	Vyasarpadi	...	...	...	...	...
22	Napier Park	...	...	...	...	...
23	Egmore	...	...	90	...	90
24	Chetpet	...	...	97	...	97
25	Kodambakkam	...	...	115	...	115
26	Saidapet	...	...	127	...	127
27	Triplicane	...	...	109	...	109
28	Mirsahibpet	...	...	74	...	74
29	Mylapore	...	...	78	...	78
30	Mandavalli	...	...	94	...	94
31	Royapettah	...	...	74	...	74
32	Adyar	...	...	69	...	69
33	Thyagarayanagar	...	...	...	...	...
34	Teynampet	...	...	...	...	...
Total		...	...	2,582	...	2,582



Showing Infants born in the year 1953 and kept under observation for a period of one year after birth.

No.	Centre	Total Number of Infants born in 1953	Number of still births in 1953	Died within												Total number of deaths excluding Still births	Left the City or otherwise not traceable	Said to be well	Out of Division	No. of living children in the city when one year old	No. of living children when one year old
				1 to 7 days		8 days to 1 month		2 to 3 months		4 to 6 months		7 to 9 months		10 to 12 months							
				Died	Not traceable	Died	Not traceable	Died	Not traceable	Died	Not traceable	Died	Not traceable	Died	Not traceable						
1	Tondiarpet	1198	31	24	...	8	...	19	1	31	...	25	1	27	...	134	2	29	177	825	1031
2	Royapuram	469	11	11	...	3	...	4	...	4	4	9	12	10	2	41	18	55	...	344	399
3	Palmyrahkuppam	262	10	9	1	2	...	9	...	4	6	12	4	5	10	41	21	24	...	166	190
4	Washermanpet	1929	66	57	52	20	14	29	20	30	40	38	38	35	40	209	204	210	25	1215	1450
5	Sanjiviroyanpet	1468	35	23	16	17	4	12	5	24	9	18	4	12	34	106	72	117	...	1138	1255
6	George Town	1007	22	32	14	11	...	4	4	34	13	15	15	13	49	109	95	123	...	658	781
7	Kothwal Bazaar	848	32	17	10	9	2	13	2	21	17	14	17	14	22	88	70	165	...	493	653
8	Trevelyan Basin	1360	26	28	29	9	8	11	10	27	23	35	28	29	69	139	167	173	...	855	1023
9	Peddunaickenpet	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	Muthialpet	659	15	15	...	6	...	7	1	16	4	14	20	1	9	59	34	70	...	481	551
11	Park Town	241	9	6	...	3	...	3	1	3	1	5	2	8	1	23	5	6	...	193	199
12	Periamet	474	16	11	2	9	...	7	3	11	4	9	14	17	15	64	38	38	...	318	356
13	Maternity Home, Choolai...	1679	33	50	23	21	10	24	20	40	24	37	20	44	61	216	158	347	...	925	1272
14	Purasawalkam	1426	33	23	6	22	1	23	5	24	8	24	9	14	32	130	61	97	...	1105	1202
15	Pulianthope	1754	56	41	21	23	15	28	16	44	26	32	39	22	80	190	197	209	...	1102	1311
16	Kilpauk	544	19	11	4	5	2	14	3	16	11	11	7	4	3	61	30	35	5	392	434
17	North Perambur	1123	25	21	17	11	2	8	18	19	15	11	7	13	29	83	88	117	36	773	926
18	Nammalwarpet	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	Sembiam	1158	40	40	3	12	1	12	1	26	...	12	...	8	5	110	10	277	74	647	998
20	Ayanavaram	677	16	24	2	13	2	10	2	15	1	13	...	8	1	83	8	64	...	506	570
21	Vyasarpadi	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Napier Park	199	...	5	...	5	...	2	1	6	1	5	2	2	3	25	7	20	...	147	167
23	Egmore	410	16	8	...	10	1	10	2	9	1	7	4	16	7	60	15	46	...	273	319
24	Chetpet	631	20	17	3	6	...	10	3	14	10	16	7	11	9	74	32	67	...	488	555
25	Kodambakkam	806	26	22	8	8	2	19	5	20	7	16	8	9	11	94	41	43	29	573	645
26	Saidapet	1591	47	36	47	22	44	30	29	30	25	30	21	20	43	168	209	194	175	798	1167
27	Tripllicane	1435	33	24	6	29	9	38	22	33	25	44	32	23	17	191	111	149	...	951	1100
28	Mirsaibpet	671	14	13	...	5	2	5	2	12	5	13	4	8	3	56	16	91	...	494	585
29	Mylapore	694	23	17	...	6	...	10	...	11	...	14	...	5	4	63	4	21	...	583	604
30	Mandavalli	503	8	15	...	2	...	10	...	13	4	15	6	9	15	64	25	52	...	354	406
31	Royapettah	475	6	10	...	6	1	10	1	19	4	16	11	13	4	74	21	17	...	357	374
32	Adyar	567	19	11	4	2	...	2	1	13	9	14	4	9	7	51	25	46	52	374	472
33	Thyagarayanagar	407	12	17	...	6	3	6	...	7	4	6	7	7	24	49	38	47	...	261	308
34	Teynampet	505	13	8	...	14	...	9	...	8	...	15	...	8	44	62	44	71	...	315	386
Total		27,219	732	646	268	325	123	398	178	584	301	545	343	424	653	2922	1866	3020	573	18,106	21,699



Showing causes of deaths among Infants born in 1953 and kept under observation during 1st year of life

Serial number.	Centre	Total number of Infants born in 1953	Total number of live births	Total number of still-births	Neo-Natal deaths					Infectious diseases					Fevers	Diseases of Respiratory System			Diseases of Alimentary System			Diseases of liver		Diseases of Urinary System		V.D.	Diseases of Nervous System			Deficiency diseases		General causes			Total number of deaths excluding still births	Not traceable	Said to be well	Out of divisions	Number of living children in the city when one year old	Total number of living children when one year old																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
					Pre-maturity	Asphyxia	Birth injuries	Congenital Malformation and their complications	Others	Cholera	Small-pox	Diphtheria	Measles	Enteric Fever		Anterior Poliomyelitis	Meningitis.	Others	Malaria	Kalaazar	Others	Tuberculosis of lungs	Pneumonia	Others	Diarrhoea		Dysentery	Others	Cirrhosis	Others	Nephritis	Others	Congenital Syphilis	Convulsion							Tetanus	T.B. Meningitis	Others	Rickets	Malnutrition	Others	Septicæmia and Pyæmia	Accidents, Injuries etc.	Snake bites or Scorpion Stings	Other causes	Causes not known																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
1	Tondiarpet	1198	1167	31	23	5										1		29		27	8	11			1		1	3				8	5					1	9	134	2	29	177	825	1031																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
2	Royapuram	469	458	11	11	1										4		6		5		4						4				4						1		41	18	55		344	399																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
3	Palmyrahkuppam	262	252	10	9	3												2	1	6	1																3	2	41	21	24		166	190																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
4	Washermanpet	1929	1863	66	46	15	6									2		29	5	17	13	2				7		2	8				21	12					10	5	209	204	210	25	1215	1450																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
5	Sanjeeviroyanpet.	1468	1433	35	16	12			1							17		15	2	20	6	1					2	3				1	6												1138	1255																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
6	George Town	1007	985	22	37	4										2		18	3	23	2	5						4	1			1	3	2						1		109	95	123		658	781																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
7	Kothawal Bazaar.	848	816	32	9	8			1									15	1		1	22					2	9				17															493	658																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
8	Trevelyan Basin	1360	1334	26	34	12	2									1		28		25	6	5	1					4				3	3							10	2	139	167	173		855	1028																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
9	Muthialpet	659	644	15	2	13										6		15	2	8	3		2					2				2															481	551																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
10	Park Town	241	232	9	4	2										2		5	1	7	1											3	1														193	199																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
11	Periamet	474	458	16	9	3	1		1		3					16		7		9		8							2																			318	354																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
12	Maternity Home, Choolai	1679	1646	33	31	15	1		10		1					8		37	5	55	15					2			21				2	8															925	1272																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
13	Purasawalkam	1426	1393	33	1	22										34		10	4	15	9							9	1			1	3																1105	1202																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
14	Pulianthope	1754	1698	56	21	15			5							10		35		61	13	4					1	11					5																1102	1311																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
15	Kilpauk	544	525	19	8	7										8		6	2	12	3	1						7					2																	394	434																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
16	North Perambur.	1122	1097	25	16	8	1									11		4	4	9	3	5					1	4	1			8	4																	773	926																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
17	Sembiam	1158	1118	40	25	13			16							13		9	2	17	4							1				1	5																		647	998																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
18	Ayanavaram	677	661	16	23	5	1									20		3	1	19				3				1				1																		506	570																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
19	Napier Park	199	199		6	1										2		6		6								1				1																			147	167																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
20	Egmore	410	394	16	12	1										6		19		10	4	1						1				2	1																			273	319																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
21	Chetpet	681	661	20	10	6	7									5		4			10	4						3					6	4	2																	488	555																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
22	Kodambakkam	806	780	26	11	15										8		7	1	26	2							1	4				2	7	2																		573	645																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
23	Saidapet	1591	1544	47	32	9			3							6		22		21	11	17	2		1			3				3	1																							798	1167																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
24	Triplicane	1435	1402	33	24											53		13	1	54	5								12				2	4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			</



## CHILD WELFARE

Statement showing the number of labour cases that came under the care and observation of Child Welfare Scheme, Infant mortality rate and Maternal Mortality rate of Child Welfare Scheme from 1940 to 1954.

Year	No. of labour cases that came under the care and observation of C. W. S.	Infant Mortality rate (per 1000) of C.W.S.	Maternal mortality rate (per 1000) of C.W.S.
1940	14,489	115.80	2.50
1941	14,984	103.40	2.60
1942	8,390	104.40	3.00
1943	11,227	113.50	2.40
1944	10,591	140.60	2.20
1945	14,002	141.90	1.57
1946	19,147	102.80	2.50
1947	18,412	81.70	1.95
1948	26,051	83.00	1.91
1949	28,129	70.41	2.31
1950	26,957	95.52	2.00
1951	29,931	123.16	1.90
1952	32,264	125.43	1.73
1953	27,219	114.23	1.76
1954	29,209	110.31	1.27

## FAMILY PLANNING

Statement showing the number of persons advised and number of sets of contraceptives issued :—

	No. of persons advised	No. of sets of contraceptives issued
1. Maternity Home, Choolai	403	76
2. Washermanpet Child Welfare Centre	450	17
3. George Town Child Welfare Centre	131	34
4. Ashok Vihar Health and Recreation Centre.	15	10
Total	999	137



Statement showing the Serological examination of blood of Antenatal cases during the year 1954.

Serial No.	Centres	Total number of blood sample examined	Number of positive cases	No. of positive cases that took full course of treatment	Number of positive cases that took partial treatment	Number of positive cases that did not turn up for treatment in spite of persuasions by the staff
1	Maternity Home, Choolai ...	1971	106	39	28	39
2	Saidadet ...	1673	110	62	19	32
3	Sanjivirayanpet ...	1351	97	29	33	35
4	Triplicane ...	1893	96	48	14	34
5	Pulianthope ...	1717	144	54	24	66
6	Washermanpet ...	1836	195	84	39	72
7	George Town ...	857	66	20	16	30
8	Sembiam ...	823	51	11	9	31
9	Purasawalkam ...	1008	56	14	20	22
10	Treveleyen Basin ...	866	48	18	16	14
		13 995	969	379	215	375



Showing the total number of Attendance of Expectant and Nursing Mothers and Children at the Out-Patient Clinic in 1954

Serial number	Centres	Attendance at Clinic								Total New Attendance	Total Old Attendance	Grand Total	Diseases Treated (New)															
		Infants		Pre-School		Expectant Mothers		Nursing Mothers					Respiratory	Alimentary	Skin Affection	Influenza	Ear and Eye diseases	Anaemia	Vitamin deficiency	Malaria	Syphilis	Fever	Toxaemia	Pyrexia	Normal	Other diseases	Total	
		New	Old	New	Old	New	Old	New	Old																			
1	Tondiarpet	...	2292	10375	1221	2993	1390	4 63	3364	11634	8267	29265	37532	662	1191	235	604	152	845	294	54	5	30	...	...	3210	985	8267
2	Royapuram	...	827	1275	114	28	1177	1464	950	1249	3068	4016	7084	223	339	38	104	20	381	214	9	...	...	...	...	1338	402	3068
3	Palmyrahkuppam	...	607	1101	123	48	623	935	818	1007	2176	3091	5267	159	306	33	189	2	271	55	8	...	...	...	...	283	870	2176
4	Washermanpet	...	3662	12849	829	891	2532	5386	4002	12379	11025	31505	42530	1229	1043	606	523	422	876	1339	253	200	...	...	...	1635	2899	11025
5	Sanjeviroyanpet	...	2610	5392	1752	1592	1505	2532	2628	5357	8495	14873	23368	1925	1054	115	128	136	238	70	28	...	...	85	15	3650	1051	8495
6	George Town	...	2662	12074	558	732	1540	4980	2678	9582	7438	27363	34806	1321	1155	42	535	24	352	237	93	2	...	3	201	1299	2124	7438
7	Kothwal Bazaar	...	2578	5626	1401	1124	1023	2769	2691	5228	7693	14747	22440	1039	1343	162	824	29	216	381	133	...	...	...	...	891	2675	7693
8	Trevelyan Basin	...	2666	6464	747	884	1491	3753	2589	5971	7493	17076	24569	1451	1499	203	423	69	657	543	129	...	...	...	...	689	1830	7493
9	Peddunaickenpet	...	471	758	118	87	519	729	489	754	1597	3328	3925	365	420	12	52	7	57	50	27	...	...	285	204	77	41	1597
10	Muthialpet	...	1078	2238	294	264	1294	2254	1229	2291	3895	7047	10942	582	867	62	176	14	336	160	34	...	...	122	164	308	1070	3895
11	Park Town	...	1008	2209	682	959	528	1532	948	1809	3166	6509	9675	756	711	146	232	37	180	221	106	...	...	335	64	154	215	3166
12	Periamet	...	1429	1430	1046	578	829	1332	1085	1429	4389	4769	9158	873	873	191	612	105	530	368	113	...	...	...	...	218	506	4389
13	Maternity Home, Choolai	...	3742	8992	1865	2451	2287	7001	3339	8378	11233	26324	38055	2589	2141	417	1545	241	492	1014	124	...	...	...	...	1119	1551	11233
14	Purasawalkam	...	3468	5482	1539	778	1784	2095	3601	5233	10392	13588	23980	2063	2009	475	1043	336	987	1081	36	...	...	...	...	750	1612	10392
15	Pulianthope	...	3529	9268	1108	840	2042	4100	4327	9657	11006	23865	34871	1419	4092	783	1290	720	683	143	18	16	...	...	...	802	1040	11006
16	Kilpauk	...	1095	4883	1011	1032	722	1543	1680	4076	4508	11534	16042	10 8	835	198	...	126	357	166	...	...	...	...	186	1129	503	4508
17	North Perambur	...	1915	5028	1693	1114	1416	2187	3006	5670	8030	13999	22029	599	1326	376	170	147	569	31	11	...	...	...	81	520	3200	8030
18	Nammalwarpet	...	492	552	152	57	467	294	478	458	1589	1361	2950	373	332	39	8	15	138	39	...	...	...	...	76	353	216	1589
19	Sembiam	...	1856	6666	265	311	1382	4534	2479	7100	5982	18611	24593	986	719	346	1158	381	973	106	...	...	...	...	...	...	1313	5982
20	Ayanavaram	...	802	2879	162	88	969	1974	959	2886	2892	7827	10719	271	348	54	...	16	113	157	...	...	...	...	107	1488	338	2892
21	Vyasarpady	...	410	474	127	101	276	314	533	518	1346	1467	2753	251	227	24	28	19	108	...	...	...	...	...	...	21	668	1346
22	Napier Park	...	608	749	162	64	661	1257	696	859	2127	2929	5056	349	507	90	176	30	263	134	38	...	...	...	100	57	384	2127
23	Egmore	...	1070	1742	564	438	937	1363	960	1698	3531	5241	8772	720	890	133	459	51	322	194	54	...	...	...	200	99	409	3531
24	Chetpet	...	1865	4980	2402	5066	976	1841	1940	4862	7183	16757	23940	1442	1333	909	918	457	494	220	...	...	...	...	...	734	676	7183
25	Kodambakkam	...	1814	7447	454	746	996	2736	2369	8114	5633	19043	24676	512	1020	118	343	3	320	77	3	...	12	...	...	1703	1522	5633
26	Saidapet	...	2994	13326	471	674	2060	5714	3138	13636	8663	33350	42013	445	1875	172	469	53	269	275	12	3	107	...	...	3598	1385	8663
27	Triplicane	...	3792	14195	802	1287	2003	5895	2965	14000	9562	35377	44939	1489	1293	399	815	154	637	635	92	50	260	...	200	2520	1018	9563
28	Mirsahibpet	...	918	1667	327	457	1351	2186	780	1623	3376	5933	9309	690	365	100	310	4	300	418	...	4	...	19	...	403	763	3376
29	Mylapore	...	873	1796	219	236	1182	1544	898	1739	3172	5315	8487	443	440	131	344	42	267	483	...	1	...	9	1	432	579	3172
30	Mandavalli	...	1198	2486	697	175	837	2400	1099	2731	3831	7792	11623	772	598	265	375	124	214	544	...	12	...	5	...	465	457	3831
31	Royapetah	...	979	2197	246	285	996	2103	1015	2041	3236	6626	9862	761	754	101	277	10	326	89	5	...	...	...	338	575	3236	
32	Adyar	...	1788	2499	1600	422	591	1647	2258	2698	6237	7266	13503	801	790	405	678	377	578	801	16	...	...	...	...	610	1181	6237
33	Teynampet	...	216	...	...	...	920	276	57	...	1193	276	1469	50	169	25	13	7	125	70	1	...	...	...	...	367	366	1193
34	Thyagarayanagar	...	178	...	22	...	685	403	32	...	917	403	1320	30	110	118	27	...	93	201	...	25	6	7	283	298	917	
		57492	159107	24778	26806	39991	85336	62080	156667	18434	427916	612257	29657	32973	7423	14898	4330	13567	10629	1397	293	434	869	1606	31543	34722	184341	

APPENDIX



## Annual Return—Maternity and Child Welfare—from 1st January to 31st December, 1954

No.	Centre	Brought under Care					Women Medical Officers	Home Visits						Clinic									Maternal Mortality and Morbidity	
		Maternity cases—Total number of mothers	Ante—Natal	Labour	Infants	Pre-School		Health Visitors				Midwives		Attendance									Mortality	Morbidity
								Ante-Natal	Post-Natal	Infants	Toddlers	Ante-Natal	Post-Natal	Number held	Ante-Natal	No. held	Infants	No. held	Pre-School	No. held	Nursing Mothers			
1	Tondiarpet	1438	1390	1278	1242	1031	836	22	29	4141	801	1630	6108	156	5653	156	12667	156	4214	156	14998	1	615	
2	Royapuram	1393	1177	439	432	399	148	37	158	5301	464	711	4921	96	2641	48	2102	48	142	48	2199	...	164	
3	Palmyrahkuppam	880	623	209	205	190	204	29	375	4006	287	1676	2383	106	1558	96	1708	96	176	96	1825	...	77	
4	Washermanpet	2731	2532	2167	2108	1450	821	612	48	2369	1863	3857	9395	156	7918	157	16511	157	1720	157	16381	7	718	
5	Sanjiviroyanpet	1521	1505	1599	1567	1255	939	114	33	3875	1028	3021	6331	158	4037	157	8002	151	3344	157	7985	1	751	
6	George Town	1544	1540	1126	1095	781	1038	235	62	3642	866	1978	5449	156	6520	157	14736	157	1290	157	12260	3	396	
7	Kothwal Bazaar	1030	1023	1050	1028	658	659	99	42	2280	439	1472	4136	156	3792	156	8204	156	2525	156	7919	1	250	
8	Trevelyan Basin	1826	1491	1293	1267	1028	274	40	14	3379	797	1037	7758	148	5244	98	9130	98	1635	98	8560	...	171	
9	Peddunaickenpet	535	519	240	237	...	195	232	30	1448	197	445	2325	53	1248	53	1229	53	205	53	1243	...	122	
10	Muthialpet	1341	1294	638	622	551	259	66	476	2972	651	492	7662	98	3548	98	3316	98	558	98	3520	...	97	
11	Park Town	563	528	239	225	199	172	614	134	3080	241	334	2885	105	2060	105	3217	105	1641	105	2757	1	107	
12	Periamet	841	829	247	241	356	99	233	533	3162	434	841	4503	108	2161	48	2859	48	1624	108	2514	...	113	
13	Maternity Home, Choolai	2287	2287	2084	2028	1272	989	473	370	7545	1190	2795	15089	156	9288	313	12731	313	4316	313	11717	3	510	
14	Purasawalkam	1784	1784	1456	1421	1202	769	11	98	4639	1008	2224	8937	154	3979	101	8950	101	2317	50	8834	3	298	
15	Pulianthope	2545	2042	1910	1855	1311	603	34	58	6164	1119	1637	11039	156	614	313	12797	313	1948	313	13984	5	996	
16	Kilpauk	897	722	563	553	434	850	69	17	3584	348	997	3557	155	2265	156	5978	156	2043	156	5756	1	165	
17	North Perambur	1426	1416	969	944	926	753	35	65	3202	723	1750	5820	147	3603	126	6943	126	2807	55	8676	...	122	
18	Nammalwarpet	469	467	206	201	...	116	73	41	3609	198	798	2774	34	761	35	1044	35	209	34	936	...	55	
19	Sembiam	1447	1382	1243	1203	998	534	...	33	1590	1100	6147	2127	160	5916	160	8522	160	576	160	9579	...	582	
20	Ayanavaram	971	969	594	569	570	127	454	258	5775	506	544	5311	70	2943	49	3681	30	250	41	3845	1	217	
21	Vyasarpadi	279	276	199	193	...	41	...	...	947	11	210	1269	40	590	40	884	40	228	40	1051	...	33	
22	Napier Park	696	661	246	239	167	159	313	187	2039	205	1058	1948	64	1918	64	1357	64	226	64	1555	...	111	
23	Egmore	982	937	393	382	319	130	321	185	2337	315	1172	4007	103	2300	197	2812	197	1002	197	2658	1	184	
24	Chetpet	1002	976	632	665	555	1069	58	101	2773	475	2222	3426	48	2817	96	6853	144	7468	48	6802	1	77	
25	Kodambakkam	1007	996	954	925	645	935	93	105	3792	546	1936	3613	152	3732	52	9261	96	1200	52	10483	...	128	
26	Saidapet	2060	2060	1907	1853	1167	859	100	47	8416	832	2241	7956	156	7774	105	16320	105	1145	52	16774	3	418	
27	Triplicane	2022	2003	1664	1631	1100	1766	126	35	10991	729	2469	9832	155	7898	154	17987	154	2089	154	16965	1	305	
28	Mirsahibpet	1367	1351	691	674	585	200	127	159	5382	621	3585	6134	105	3537	52	2585	52	784	52	2403	...	199	
29	Mylapore	1182	1182	625	608	604	200	...	392	4482	681	1046	5282	105	2726	52	2669	52	455	52	2637	1	51	
30	Mandavalli	851	837	410	401	406	187	30	146	4129	329	1619	3932	104	3237	47	3684	46	872	46	3830	...	53	
31	Royapettah	1005	996	462	453	374	342	25	179	2459	378	1627	3477	105	3099	52	3176	52	531	52	3056	...	93	
32	Adyar	611	591	494	489	472	1185	119	163	4616	298	1261	3334	143	2238	96	4287	96	2022	48	4956	1	43	
33	Teynampet	951	920	526	512	386	155	67	158	2526	449	1239	3497	96	1196	36	216	...	...	36	57	...	114	
34	Thyagarayanagar	689	685	406	394	308	179	36	109	2248	429	1142	2765	99	1088	24	178	24	22	24	32	2	81	
		42173	39991	29209	28462	21699	17792	4897	4840	132900	20558	57213	178983	4003	125327	3649	216599	3679	51584	3428	218747	37	8416	



## CHILD WELFARE

List of Child Welfare Centres where Serological examinations of blood of  
Ante-natal cases are conducted :

1.	Maternity Home, Choolai	...	from	27—9—1951
2.	Saidapet Child Welfare Centre	...	„	Dec. 1951
3.	Sanjiviroyanpet Child Welfare Centre	...	„	May 1952
4.	Triplicane „ „	...	„	27—5—1952
5.	Pulianthope „ „	...	„	1—5—1953
6.	Washermanpet „ „	...	„	7—5—1953
7.	George Town „ „	...	„	1—4—1954
8.	Sembiam „ „	...	„	1—4—1954
9.	Purasawalkam „ „	...	„	1—4—1954
10.	Treveleyen Basin „ „	...	„	1—4—1954

List of Child Welfare Centres where family Planning  
Clinics are Conducted.

1.	Maternity Home, Choolai	...	from	1—8—1952
2.	George Town Child Welfare Centre	...	„	„
3.	Washermanpet „ „	...	„	„
4.	Ashok Vihar Health and Recreation Centre	...	„	1954



## APPENDIX I

## LIST OF CHILD-WELFARE CENTRES

Serial Number	Name of Centre	Name of Division	Location	Division Number	Beds in Wards	Date of opening
1	Tondiarpet	New Washermanpet	385, Thiruvottiyur High Road, Tondiarpet	1	18	13- 8-1947
2	Palmyrahkuppam	Royapuram	Near Corporation Model Lines, Palmyrahkuppam.	2	...	10- 9-1949
3	Royapuram	Singarathottam	26, Suriyanarayana Chetty Street, Royapuram	3	...	3-11-1924
4	Sanjiviroyanpet	Sanjiviroyanpet	21/22, Kappal Polu Chetty Street, Washermanpet.	4	20	23- 3-1948
5	Washermanpet	Korukkupet	86, Thiruvottiyur High Road, Washermanpet	5	12	26- 5-1919
6	Vyasarpady	Vyasarpady	Bharathi Road, Perambur	6	12	1-10-1954
7	Peddunaickenpet	Peddunaickenpet	18, Zinda Sahib Street, Peddunaickenpet	8	...	14- 7-1954
8	George Town	Seven Wells	44, Amman Koil Street, George Town	9	15	17- 5-1922
9	Kothwal Bazaar	Amman Koil	1/27, Appumaistry Street, George Town	10	8	24- 9-1947
10	Muthialpet	Muthialpet	175, Thambu Chetty Street, George Town	11	..	24- 8-1924
11	Trevelen Basin	Trevelen Basin	52, Trevelen Basin Street, Sowcarpet	16	12	19- 7-1945
12	Maternity Home	Choolai	15, Vijayavigneswarar Koil Street, Choolai	17	35	29- 8-1947
13	Pulianthope	Pulianthope	1/33, Gantz Road, Pulianthope (Previously at Pulianthope High Road)	18	18	15- 9-1950 (3- 6-1928)
14	North Perambur	Perambur Barracks	54, Perambur High Road, Perambur	19	...	31- 5-1940
15	Sembiam	Sembiam	45, Paper Mills Road, Sembiam	20	8	9- 9-1946
16	Ayanavaram	Ayanavaram	United India Colony, Ayanavaram (Previously at 7 Gurusappa Maistri Street)	21	..	10- 4-1954 (28-10-1948)
17	Kilbambur	Kilbambur	10, Halls Road, Kilbambur	22	8	28- 6-1944



# APPENDIX I

19	Kosapet	...	Kosapet	...	8, Chellappa Mudi Street, Kosapet	...	23	...	30-4-1954
20	Purasawalkam	...	Vepery	...	109, Purasawalkam High Road, Purasawalkam	...	24	...	31-8-1955
21	Periamet	...	Periamet	...	4/8, Naval Hospital Road, Periamet	...	25	7	10-10-1919
22	Mallaya Market	...	Eddapalayam	...	Mallaya Market, Wall Tax Road	...	26	...	7-3-1946
23	Park Town	...	Park Town	...	2/3, Periera Street, Park Town	...	27	...	10-6-1955
24	Napier Park	...	Napier Park	...	1/61, Arunachala Naicken Street, Chintadripet	...	28	...	30-5-1940
25	Egmore	...	Komaleeswaranpet	...	37, Langs Garden Road, Pudupet	...	29	..	16-5-1954
26	Chetpet	...	Thousand Lights	..	27, Jagannathapuram 2nd Street, Chetpet	...	31	...	7-7-1923
27	Kodambakkam	...	Kodambakkam	...	68, Arcot Road, Kodambakkam	...	33	6	24-9-1923
28	Royapettah	...	Royapettah	..	84, Lloyds Road, Royapettah	...	35	10	5-1-1949
29	Triplicane	...	Pudupakkam (Thiruvateeswaranpet)	...	8, Nyniappa Maistry Street, Triplicane (Previously at Muthu Mudali Street, Triplicane)	...	37	...	9-10-1929
30	Mirsahibpet	...	Mirsahibpet	...	65, Dr. Besant Road, Triplicane	...	38 39 43	... 14 ...	1-8-1955 (15-9-1917) 25-10-1941
31	Mylapore	..	Mylapore North	...	48, Bazaar Road, Mylapore	...	44	...	4-8-1924
32	Teynampet	...	Teynampet	...	104, Mount Road (Corporation Dispensary Building)	...	46	...	10-3-1948
33	Saidapet	...	T. Nagar (South)	..	2, Jeenis Road, Saidapet	...	47	18	28-11-1946
34	T Nagar	...	T. Nagar (South)	...	3, Sivagnanam Road (Corporation Dispensary Building)	...	47	...	10-3-1948
35	Saidapet	...	Saidapet	...	24, Dhanapal Chetty Street, Saidapet	..	48	...	30-3-1955
36	Mandavalli	...	Adyar	...	34, Brodies Road, Adyar	...	50	...	11-2-1946
37	Adyar	...	Adyar	...	44, Vasantha Press Road, Arunachalapuram, Adyar.	...	50	6	31-10-1947

Creches:—1. Broadway  
 2. Royapuram  
 3. Chetpet

Bunder Rama Naicken Garden, Broadway  
 At Royapuram Child Welfare Centre  
 At Chetpet Child Welfare Centre

9  
 3  
 33

14 11-1947  
 4-3-1951  
 29-12-1951



## APPENDIX B.

## The Production of Sulphuretted Hydrogen in the Slow Sand Filters at the Madras Water works.

By

S. V. GANAPATI, B.A., M.Sc., A.R.I.C.

(From the Health Department of the Corporation of Madras)

## INTRODUCTION

Within a year after the opening of the Water Works in 1914 sulphuretted hydrogen was noticed in the stored-up filtered water, and along with it a colourless gelatinous growth in long trailing filaments; these rendered the water served out to the people turbid and foul-smelling.

With a view to eradicate this evil, as many as nine investigations were made in the course of 18 years at the instance of both the Municipal Corporation and the Madras Government. These investigations were, however, mostly empirical and of an engineering nature, attention being mainly focussed on the removal of excessive organic matter which was supposed to generate hydrogen sulphide through decomposition by saprophytic bacteria. The authors of the several investigations did not consider it worth while to examine the exact mechanism of  $H_2S$  production in the slows and filters. Efforts were, therefore, finally directed to investigate thoroughly the biochemical aspect of  $H_2S$  production in the Madras filters.

A study of the physical, chemical and biological conditions of the lake water (the lake being situated about eight miles away from the filters) and of the pre-filtration water at the Waterworks showed practically no change. A high inverse correlation was found to exist between the lake level on the one hand, "absorbed oxygen," "albuminoid nitrogen," "alkalinity," "chlorine" and "sulphate" on the other; and similarly between "absorbed oxygen" and "dissolved oxygen." A direct correlation was, on the other hand, found to exist between the "lake level" and "dissolved oxygen" and between "absorbed oxygen" and "inorganic sulphate."

Considerable changes were noticed in the effluent from sand filters working at 4 inches or 6 inches vertical per hour. The following were some of the important features of these changes which were observed:—

A. *Physical*.—(i) A change in the colour and transparency of water.

(ii) Smell of  $H_2S$ .

B. *Biological*.—(i) An Iron bacterium, *Leptothrix Ochracea* (See Plate I.) with several species of *Diatoms* and *Infusors* were found to develop on the walls of the filtered water chamber.

(ii) With the production of  $H_2S$ , *Leptothrix* was gradually replaced by colourless sulphur bacteria—*Beggiatoa* (Plate 2.) and *Thiothrix* (Plate 3.) *Sphaerotilus natans* (Plate 4.) and globules of sulphur (Plate 5.)

(iii) Fine sand several inches below the filtering skin ("Schlamm-decke") turned black due to iron sulphide.

C. *Chemical*.—(i) Increased figures for "free ammonia" "free carbondioxide," "free sulphuretted hydrogen," and decreased figures for "absorbed oxygen" dissolved oxygen and "albuminoid nitrogen" and pH.

(ii) Absence of nitrites and nitrates.



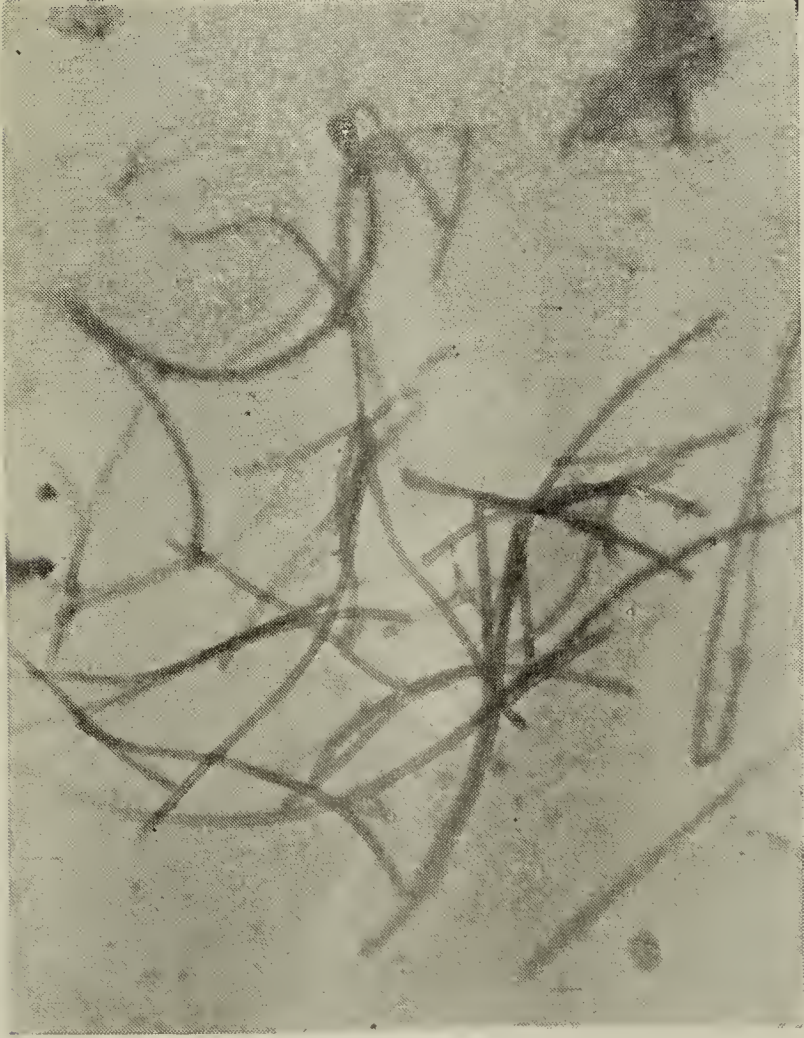


Plate I : An Iron Bacterium, LEPTOTHRIX OCHRACEA  
seen in the filtered water chambers of slow  
sand filters in the early stage of their working.

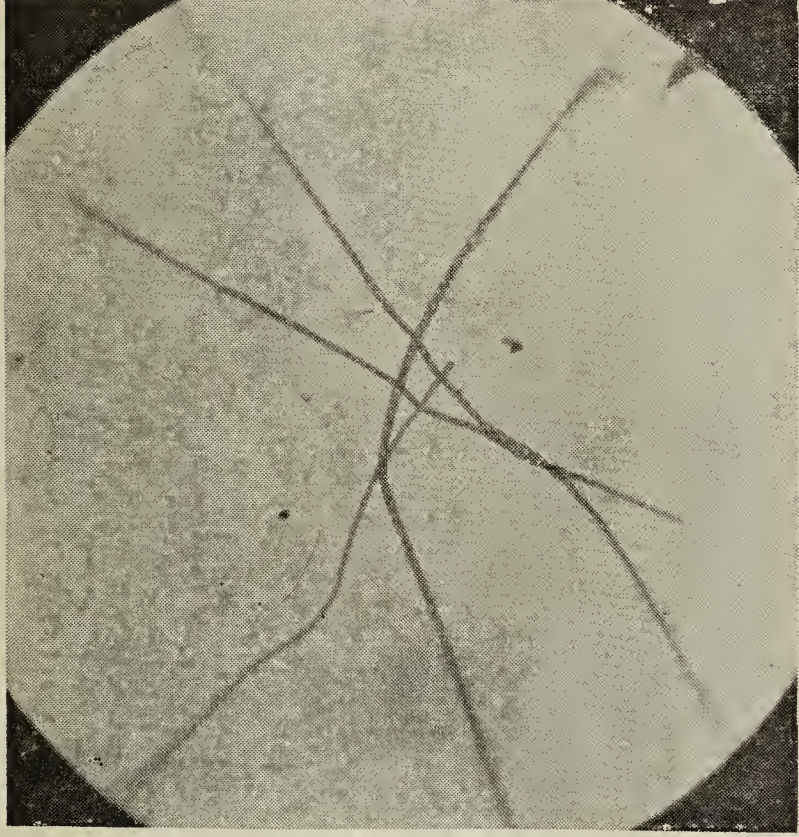


Plate II: Colourless Sulphur Bacterium BEGGIATO A ALBA  
seen in the filtered water chambers of the  
slow sand filters when they begin to produce  
sulphur-tted hydrogen ( $H_2S$ ).



Plate III: Another Sulphur Bacterium THIOTHR IX NIVEA  
seen in the filtered water chambers of slow  
sand filters when they produce sulphuretted  
hydrogen  $H_2S$  in large amounts.







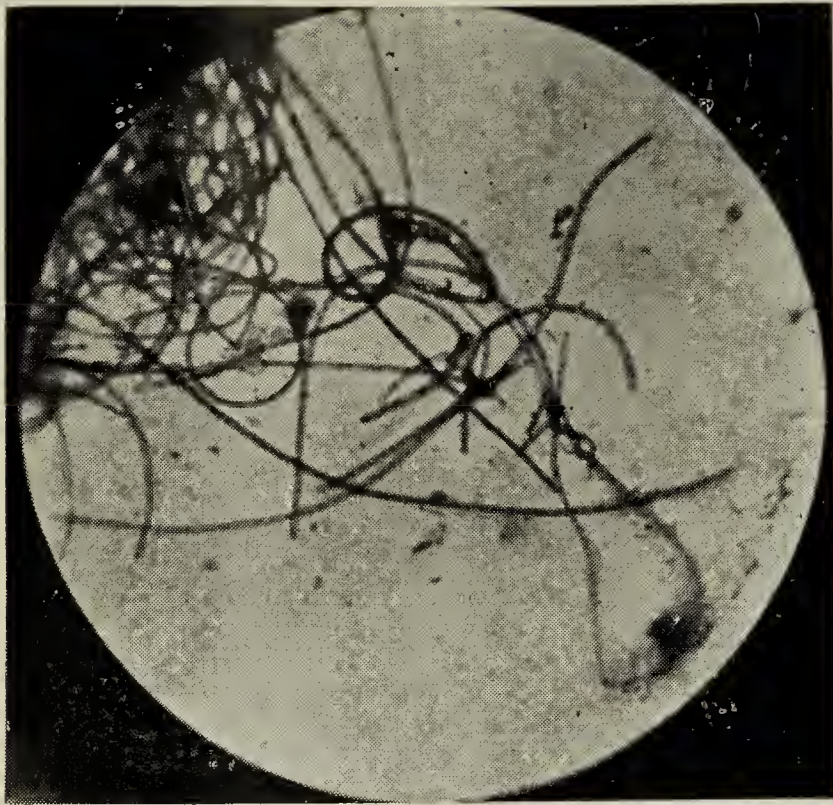


Plate IV:—Another organism called SPHACROTILUS NATANS seen growing in filtered water chambers of slow sand filters, when they produce sulphuretted hydrogen ( $H_2S$ ).

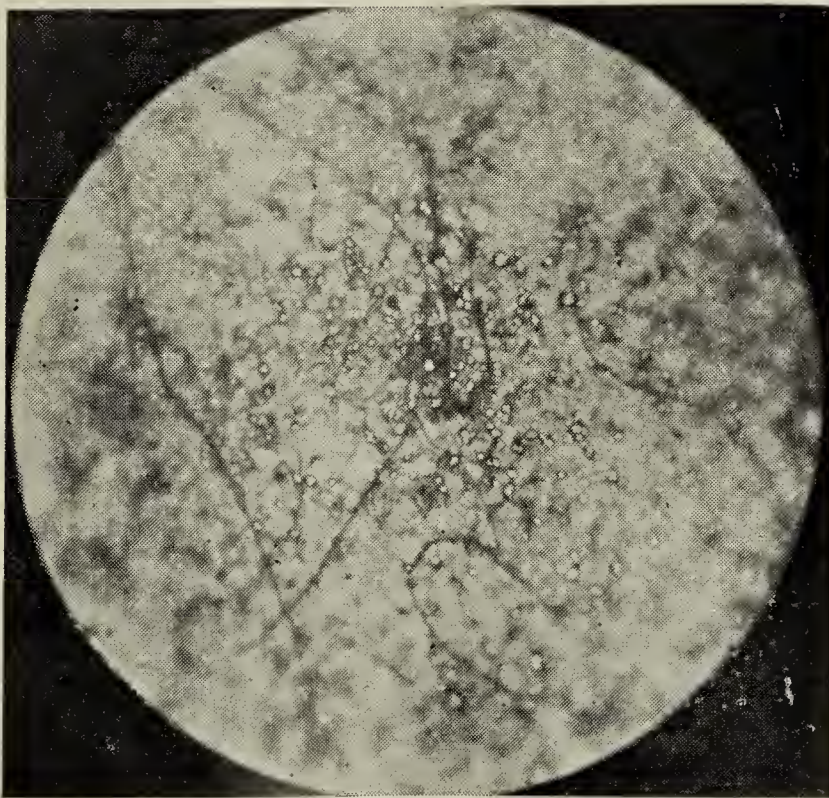


Plate V:—Granules of sulphur seen in the filtered water chambers of slow sand filters which produce  $H_2S$  in large amounts.







(iii) Loss of an appreciable amount of organic matter and particularly of "inorganic sulphates," Table I shows the relation between inorganic sulphate in raw and filtered water and  $H_2S$  produced in a sand filter bed.

TABLE I.

Showing the relation between inorganic sulphates in raw and filtered water and  $H_2S$  produced in the Slow Sand Filter Bed No. 1.

Date of starting.	Date of Estimation.	S.O <sub>3</sub> . in milligrammes per litre.			H <sub>2</sub> S. in Milligrammes per litre.	
		Raw Water.	Filtered Water.	Difference	Calculated from the difference of SO <sub>3</sub> .	Actually found in the filtrate.
10-8-1929	14-8-1929	22.4	20.3	2.1	0.9	0.5
	16-8-1929	22.5	20.6	1.9	0.8	1.2
	19-8-1929	22.5	20.0	2.5	1.1	2.1
	21-8-1929	22.5	19.7	2.8	1.2	3.2
	25-8-1929	22.7	20.4	2.3	1.1	4.4
	26-8-1929	Filter Stopped.				

The decreased quantity of inorganic sulphates in the filtrate as compared with that in raw water led to the examination of sulphate reduction as a probable cause of  $H_2S$  production along with other—possible causes, such as the decomposition of sulphur-bearing proteins by the action of common bacteria.

The amount of inorganic and organic sulphur in one litre of Red Hills Lake water was then estimated. Table II shows the results of analysis.

TABLE II.

Showing the Amount of Inorganic and Organic Sulphur (Calculated as SO<sub>3</sub>) in Raw Water.

Date	SO <sub>3</sub> in milligrammes per litre		Organic Sulphur by difference
	Total Sulphur	Inorganic Sulphur	
7-6-1929	20.9	20.8	0.1
28-6-1929	21.9	21.8	0.1
14-7-1929	22.3	22.3	Nil
14-8-1929	22.4	22.4	Nil
7-9-1929	24.0	24.0	Nil



The organic sulphur, it will be seen is practically negligible. A reference to the study of Wisconsin lakes by Peterson, Fred and Domogella shows that Cystine, the sulphur-containing amino-acid, varied from 1.5 to 7.5 mgrm. per cu. m. in the different lakes, and in one lake the surface water contained much less than the bottom sample. The Red Hills Lake water, drawn as it is from near the surface, contains only negligible quantities of sulphur-bearing proteins in a litre of water. The only source of sulphur appears therefore, to be the inorganic sulphates of raw water.

There are numerous bacteria capable of producing  $H_2S$  from Sulphur compounds but only a few capable of reducing sulphates to sulphides are known. The most well known are *Vibrio Hydrosulfures* and *Bacterium Hydro-sulfuricum pointicum*, isolated respectively by Brusilowsky(11) and Zelinsky(12) from the estuary of the Black Sea. Nadson(13) found that two other bacteria, viz., *Proteus vulgaris* and *Bacillus Mycoides*, had the power of reducing calcium sulphate in the presence of a limited supply of oxygen. Beijerinck(14) isolated another bacterium of this type, which he designated as the *Spirillum Desulfuricans*, from water derived from bogs and mires. Van Delden (15) came across another specimen in sea water, called by him *Microspira Aestuvarii*, which resembled *Spirillum Desulfuricans* in its action. Another sulphate reducer is Sawjallow's(16) *Actino-mycetes Pelogens* isolated from black "heilschlamme," an organism morphologically different from that isolated by Beijerinck and Van Delden.

Experiments using Van Delden's medium proved the presence of sulphate reducers in (a) the black slime at the bottom of Red Hills Lake; (b) the blackened growths of *Plumatella Tangynaikae* (Rousselet) which infest the conduit (eight miles long) leading from the lake to the waterworks at Kilpauk; and (c) the blackened sand found several inches below the "filtering skin" of the sand filters.

Three sets of two bottles, each of 550 c. c. capacity, were filled with Van Delden's medium of the following composition:—

Raw water or tap water.....	1,000.0	C.C.
$K_2HPO_4$ -----	0.500	gram.
Sodium lactate-----	2.750	„
$MgSO_4 \cdot 7H_2O$ .-----	0.55	„
Ferrous sulphate-----	trace.	

To each set was added small quantities of (1) slime from the lake, (2) blackened *Plumatella* growth, and (3) black sand. The bottles were stoppered and incubated in the dark at the laboratory temperature (30. deg. Cent). The contents became hazy on the second day, darkened on the third, and turned jetblack at the end of a week. A distinct smell of  $H_2S$  could be perceived when the bottles were opened after a week.

The total  $H_2S$  dissolved in the liquid was quantitatively estimated by the method described by Beijerinck and Van Delden (loc. cit.) in connection with impure cultures of sulphate reducers. The results are set out in Table III.



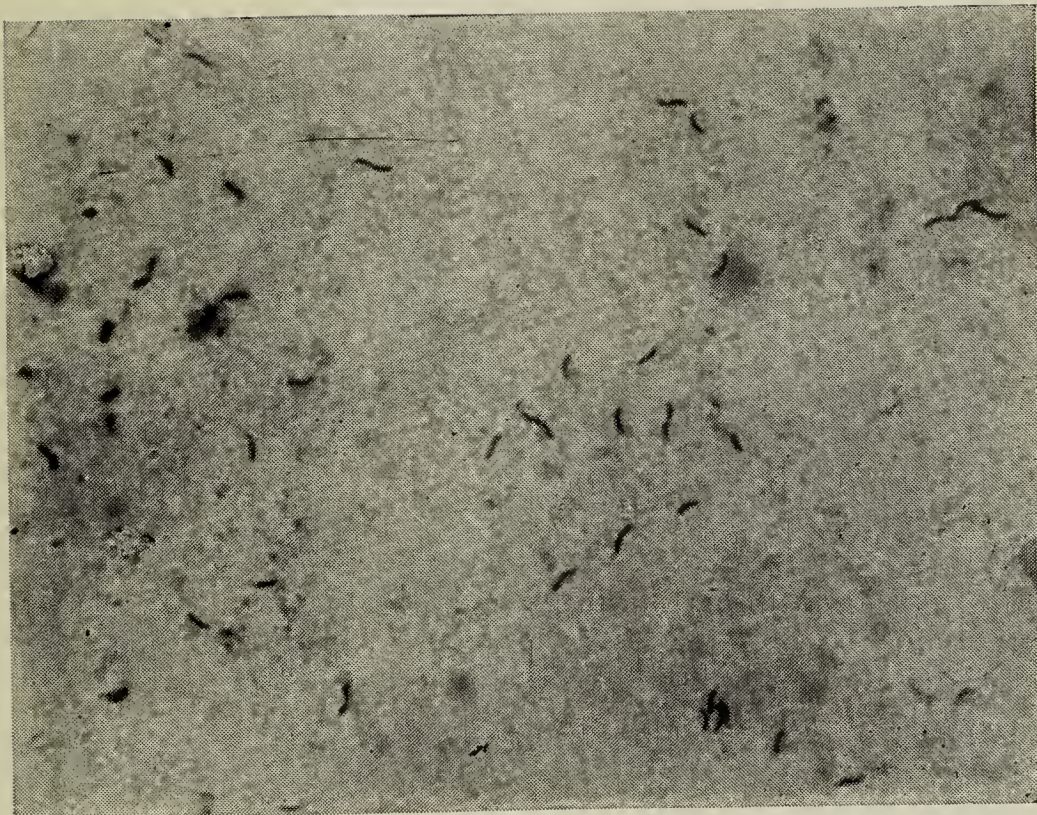


Plate VI: A photo—Micrograph of SPIRILLUM  
DESULFURICANS Which reduces sulphates in water  
to sulphuretted hydrogen ( $H_2S$ ).







TABLE III.

Showing Sulphate Reduction using an Impure Culture of Sulphate Reducers Isolated from Black Filter Sand (Bed No. I)

Composition of the liquid culture	Date of analysis	H <sub>2</sub> S found in culture medium mg/litre	SO <sub>3</sub>		Remarks
			Calculated from H <sub>2</sub> S mg/litre	Total Sulphate taken mg/litre	
Raw water 550 cc.	5-8-1930	...	...	325	Expt. started
K <sub>2</sub> HPO <sub>4</sub> 0.25 gm.	11-8-1930	22.6	53.2		
Sodium lactate 2.50 gm.	13-8-1930	23.6	55.5		
Asparagine 0.50 gm.	14-8-1930	33.3	71.3		
MgSO <sub>4</sub> .7H <sub>2</sub> O 0.55 gm.	15-8-1930	50.5	118.8		
	19-8-1930	105.9	249.2		77 p.c. of sulphate reduced
	22-8-1930	92.3	217.2		
	23-8-1930	93.2	219.3		
	29-8-1930	89.9	211.5		
Added 1 gm. of sodium lactate and 0.5 gm. of MgSO <sub>4</sub> . 7 H <sub>2</sub> O and filled the bottle with the original liquid after estimation on 29-8-1930.	3-9-1930	176.5	415.3	621	
	9-9-1930	193.6	455.5		73 p.c. reduced
	12-9-1930	165.8	390.1		
	17-9-1930	160.9	378.6		

Column 6 shows that nearly 77 per cent. of the sulphate was reduced to H<sub>2</sub>S and estimated as such. The addition of magnesium sulphate and sodium lactate resulted in further reduction. Beijerinck and Van Delden also report finding similar increase in the concentration of H<sub>2</sub>S in the liquid on further addition of soluble sulphates.

Table IV sets forth the effect of temperature on these bacterial reductions of sulphates. The optimum temperature appears to lie between 28 deg. and 31 deg. Cent. The reduction was greatly inhibited at temperatures below 22 deg. Cent. and above 41 deg.



TABLE IV.

Showing the Effect of Temperature on Sulphate Reduction.

Date	Composition of the liquid culture	Milligrammes per litre.								
		SO <sub>2</sub>			SO <sub>2</sub>			SO <sub>2</sub>		
		H <sub>2</sub> S	Calcu- lated from H <sub>2</sub> S	Origi- nally pre- sent	H <sub>2</sub> S	Calcu- lated from H <sub>2</sub> S	Origi- nally pre- sent	H <sub>2</sub> S	Calcu- lated from H <sub>2</sub> S	Origi- nally pre- sent
		28 deg. to 31 deg. Cent.			Below 22 deg. Cent.			42 deg. Cent.		
Octo- ber 5, 1931,	Distilled water 300cc. K <sub>2</sub> HPO <sub>4</sub> —0.15 gm.	134.8	317.2	487	70.4	165.6	487	82.1	193.2	487
to Nov. 4, 1931.	Sodium Succinate 1.5 gm. Asparagine—0.3 gm. MgSO <sub>4</sub> . 7 H <sub>2</sub> O —0.45 gm.	...	...	...	...	...	...	...	...	...

This is precisely what Beijerinck and Van Delden have observed regarding the optimum temperature conditions for the activity of *Spirillum Desulfuricans*.

A series of experiments were next carried out with a view to ascertain how far the sulphate reduction depended upon the presence of organic matter which acted as nutrients for the bacteria. The results of a typical experiment of this series are given in Table V.

“There is a close relationship between sulphate reduction and organic nourishment,” so remarked Van Delden (loc. cit.). Lactates, malates, succinates, acetates, peptones etc., serve admirably as organic nutrients, and with the addition of fresh organic substances further reduction took place. The maximum reduction took place in two to three weeks.

Van Delden found that the presence of nitrates was prejudicial to sulphate reduction by the bacteria. Nitrites, and nitrates, as already stated, are singularly absent in the lake water, and it may be assumed that were this not the case, sulphate reduction would have been considerably retarded, if not stopped completely. Table No. VI contains an account of experiments undertaken to test the inhibitive action of nitrates on sulphate reduction by the cultures obtained from the Madras Water Supply.

All the above experiments tend to confirm the conclusion that the reducers found in the Madras water are the same as, or are very similar to, those isolated by Beijerinck and Van Delden.

#### *Isolation of Pure Cultures.*

Attempts to obtain distinct colonies in Mcleod's or Bullock's anaerobic apparatus were not successful, but Van Delden's method was found highly suitable. Distinct colonies with black halos of iron sulphides were obtained on Petri-dishes containing Van Delden's agar medium with .5 per cent of sodium thiosulphate or sodium sulphite solution. When the agar had set, the dishes were filled with sterile vaseline and kept at room temperature, and after a week several black dots with an effulgence of iron sulphide were seen scattered all over the dish. Difficulty was experienced in isolating the black colonies for pure culture on account of the presence of vaseline. But the test tube cultures (as suggested by Van Delden) gave better results in agar with or without thiosulphate.



TABLE V

Showing the organic substances which favour sulphate reduction

Composition of the liquid culture	Date of starting the expt. and esti- mation of H <sub>2</sub> S	Milligrammes per litre			Remarks
		H <sub>2</sub> S found	SO <sub>3</sub>		
			Equivalent SO <sub>3</sub> calcu- lated from H <sub>2</sub> S	Total sul- phate taken	
1. Raw water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.15 grm. Sodium lactate 0.5 grm.	9-10-30 6-11-30	13.0	30.6	177	0.5 grm. Na-lac- tate and 0.5 grm. MgSO <sub>4</sub> . 7H <sub>2</sub> O were added on 28-10-30.
2. Distilled water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.15 grm.	9-10-30 28-10-30	... 4.6	... 10.8		
NH <sub>4</sub> Cl 0.15 grm. Na-lactate 0.5 grm. MgSO <sub>4</sub> .7H <sub>2</sub> O 0.3 grm.	6-11-30 17-11-30 26-11-30	24.5 144.0 145.8	57.6 338.8 343.1		
3. Distilled water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.15 grm. Glycocoll 0.15 grm. Na-succinate 0.55 grm. MgSO <sub>4</sub> .7H <sub>2</sub> O 0.3 grm.	20- 2-31 6- 3-31 11- 3-31	... 36.8 63.1	... 86.6 148.5	177	84 per cent reduced.
4. Distilled water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.3 grm. Peptone 0.3 grm. Dextrose 0.3 grm. CaSO <sub>4</sub> .2H <sub>2</sub> O 0.2 grm.	9-10-30 28-10-30 6-11-30 17-11-30	... 40.7 59.1 62.8	... 95.8 139.0 147.8	169	87 per cent rceuced.
5. Tap water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.3 grm. Glucose 0.55 grm. CaCO <sub>3</sub> 0.55 grm. CaSO <sub>4</sub> .2H <sub>2</sub> O 0.60 grm.	9-10-30 28-10-30 6-11-30 17-11-30	... 53.7 89.3 116.4	... 126.3 210.1 273.9	507	Added 0.3 grm. glucose on 28-10-30. 54 per cent reduced.
6. Tap water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.3 grm. NH <sub>4</sub> Cl 0.3 grm. Glucose 0.3 grm. CaSO <sub>4</sub> .2H <sub>2</sub> O 0.6 grm.	9-10-30 28-10-30 6-11-30 17-11-30	... 33.3 72.0 93.4	... 78.4 169.4 219.8	507	0.3 grm. glucose added on 28-10-30. 43 p.c. reduced.
7. Tap water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.3 grm. NH <sub>4</sub> Cl 0.3 grm. Glucose 0.3 grm. CaSO <sub>4</sub> .2H <sub>2</sub> O 0.3 grm.	20- 2-31 6- 3-31 11- 3-31 4- 4-31	... 58.9 50.2 70.6	... 138.6 118.1 166.1	254	65 per cent reduced.
8. Tap water 550 c.c. K <sub>2</sub> HPO <sub>4</sub> 0.3 grm. Asparagine 0.3 grm. Na-acetate 0.3 grm. CaSO <sub>4</sub> .2H <sub>2</sub> O 0.6 grm.	9-10-30 17-11-30	... 81.2	... 191.1	507	38 per cent reduced.



TABLE V—(Contd.)

Showing the organic substances which favour sulphate reduction

Composition of the liquid culture		Date of starting the expt. and estimation of $\text{H}_2\text{S}$	Milligrammes per litre			Remarks
			$\text{H}_2\text{S}$ found	$\text{SO}_3$		
				Equivalent $\text{SO}_3$ calculated from $\text{H}_2\text{S}$	Total sulphate taken	
9. Tap water	550 c.c.	9-10-30	...	...	507	63 per cent reduced.
$\text{K}_2\text{HPO}_4$	0.3 grm.					
Asparagine	3.5 grm.	6-11-30	122.5	288.2		
Na-citrate	1.25 grm.					
$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	0.6 grm.	17-11-30	134.8	317.2		
10. Tap water	550 c.c.	9-10-30	...	...	507	63 per cent reduced.
$\text{K}_2\text{HPO}_4$	0.3 grm.					
Asparagine	0.5 grm.	6-11-30	125.3	294.8		
Na-K-tartrate	1.25 grm.					
$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	0.6 grm.	17-11-30	134.8	317.2		
11. Tap water	550 c.c.	10- 2-31	...	...	355	84 per cent reduced.
$\text{K}_2\text{HPO}_4$	0.3 grm.	19- 2-31	44.8	105.4		
Asparagine	0.5 grm.					
Na-succinate	1.25 grm.	6- 3-31	131.4	309.2		
$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	0.6 grm.	11- 3-31	126.3	297.2		
12. Tap water	550 c.c.	10- 2-31	...	...	507	70 per cent reduced. Added 0.3 grm. Na-succinate and 0.5 grm. $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ . 82 p.c. reduced.
$\text{K}_2\text{HPO}_4$	0.8 grm.	19- 2-31	24.7	58.1		
Asparagine	0.5 grm.	6- 3-31	150.7	354.6		
Na-succinate	1.25 grm.	11- 3-31	155.4	365.7	802	
$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	280.8 grm.	4- 4-31	659.1	...		
13. Tap water	550 c.c.	20- 2-31	...	...	1182	46 per cent reduced.
$\text{K}_2\text{HPO}_4$	0.3 grm.	6- 3-31	217.3	511.3		
Asparagine	0.5 grm.	11- 3-31	194.3	457.2		
Na-malate	1.25 grm.					
$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	2.0 grm.	4- 4-31	232.0	545.9		
14. Tap water	550 c.c.	9-10-30	...	...	507	45 per cent reduced.
$\text{K}_2\text{HPO}_4$	0.3 grm.					
Asparagine	0.6 grm.	6-11-30	86.5	203.5		
$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	0.6 grm.	17-11-30	96.5	227.1		
15. Tap water	550 c.c.	9-10-30	...	...	413	68 per cent reduced.
$\text{K}_2\text{HPO}_4$	0.3 grm.	6-11-30	76.4	179.7		
Asparagine	0.5 grm.					
Na-taurocholate	1.25 grm.	17-11-30	119.5	281.2		
$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	0.7 grm.					



Following his method, two kinds of black colonies were noticed. One formed an intense black spot without a halo, while the other formed a gradually spreading "courtyard" of iron sulphide round the black point. The first kind was met with less frequently than the second. A microscopic examination of the black colonies, which were easily stained either with alcoholic gentian violet or alcoholic basic fuchsin showed that they always consisted of "short, slightly twisted spirilla" as described by Van Delden and Beijerinck. When treated with dilute HCl, H<sub>2</sub>S was given off and the black colour disappeared.

Agar tubes which contained only two or three distinct isolated colonies were broken, cut with a sterile knife, and the black colonies were transferred to sterilised liquid media in bottles which were stoppered and incubated at about 30 deg. Cent. In about three days the medium became hazy and black (if ferrous sulphate was present.) A microscopic examination of the liquid revealed (i) small spirilla in plenty, and (ii) a short thick bacillus with rounded ends. Van Delden, however, came across an organism of the *Aerobacter* group accompanying the spirillum instead of the bacillus with rounded ends. Pure cultures were obtained only after a number of unsuccessful attempts had been made. A drop of the fluid poured on to a plate of ordinary nutrient agar showed no growth thereby proving the purity of the culture (Van Delden).

TABLE VI.  
Showing the Influence of Nitrate on Sulphate reduction.

Composition of the liquid culture —		Date of starting the expt. and estimation of H <sub>2</sub> S	Milligrammes per litre			Remarks.
			H <sub>2</sub> S found	Equivalent SO <sub>5</sub> calculated from H <sub>2</sub> S	Total Sulphate taken	
A						
Tap Water	550 c.c.	20-2-31	...	...	1182	...
K <sub>2</sub> HPO <sub>4</sub>	0·3 gram.	11-3-31	186·2	438·1	...	37 per cent reduced
Asparagine	0·5 gram.	4-4-31	293·0	689·4	...	58 per cent reduced
Na-succinate	2·0 gram.	...	...	...	...	...
MgSO <sub>4</sub> ·7 H <sub>2</sub> O	2·0 gram.	...	...	...	...	...
B						
Tap Water	550 c.c.	20-2-31	...	...	1182	...
K <sub>2</sub> HPO <sub>4</sub>	0·3 gram.	} 11-3-31	9·8	23·1	...	2 per cent reduced Nitrate present
KNO <sub>3</sub>	0·5 gram.					
Na-succinate	2·0 gram.	4-4-31	71·6	168·5	...	14 per cent reduced
MgSO <sub>5</sub> ·7 H <sub>2</sub> O	2·0 gram.	...	...	...	...	Nitrate absent

Plate No. 6 Shows a pure culture of the sulphate reducing organisms obtained by the methods described above. They have a 'microspira form' and measure approximately 4 p. long and 1 p. thick. Those found in the liquid cultures were smaller than those found in the agar



TABLE VII.

Showing Sulphate Reduction using a Pure Culture of  
*Spirillum Desulfuricans*

Composition of the liquid culture	Date of starting the expt. and estimation of $H_2S$	Milligrammes per litre $SO_3$		
		$H_2S$ found	Equivalent $SO_3$ Calculated from $H_2S$	Total sulphate taken
1. Tap water 550 c.c. $K_2HPO_4$ 0· gram. Asparagine 0·5 gram. Na-succinate 2·0 gram. $MgSO_4 \cdot 7H_2O$ 2·0 gram.	23-3-31	...	...	1,182
2. Tap water 550 c.c. $K_2HPO_4$ 0·3 gram. Asparagine 0·5 gram. Na-lactate 2·0 gram. $MgSO_4 \cdot 7H_2O$ 2·0 gram.	23-3-31	...	...	1,182
3. Tap water 200 c.c. $K_2HPO_4$ 0·05 gram. Asparagine 0·5 gram. Na-acetate 1·0 gram. $MgSO_4 \cdot 7H_2O$ 0·2 gram.	18-4-31	..	...	325
4. Tap water 200 c.c. $K_2HPO_4$ 0·05 gram. Asparagine 0·2 gram. Na-acetate 1·5 gram. $MgSO_4 \cdot 7H_2O$ 9·2 gram.	18-4-31	...	...	325
5. Tap water 300 c.c. $K_2HPO_4$ 0·15 gram. Na-acetate 1·5 gram. $MgSO_4 \cdot 7H_2O$ 0·3 gram.	17-9-31	...	..	325
6. Tap water 300 c.c. $K_2HPO_4$ 0·15 gram. Na-acetate 1·5 gram. Asparagine 0·3 gram. $MgSO_4 \cdot 7H_2O$ 0·3 gram.	17-9-31	...	...	325

cultur (Van Delden). Attempts to discover the terminal bunch of "flagella" (Beijerinck, loc. cit.) by Muir's modified Pitfield or Loeffler's method were unsuccessful.

Different sterilissd media were inoculated with 0·5 c.c. of the pure liquid culture. The results are shown in Table No. VII.

They serve to confirm further our view that the only effective agent in sulphate reduction in the Madras Water is the *Spirillum Desulfuricans*.

Salt acted prejudicially to the production of  $H_2S$ . This would be obvious from an inspection of the data given in Table VIII. The organisms seem to be most active when salt is absent, and as the quantities of salt added were increased, there was a progressive diminution in the amount of  $H_2S$  produced. The maximum concentration of salt which these organisms could tolerate with comfort was found to be about 0·5 per cent: an observa-



TABLE VIII

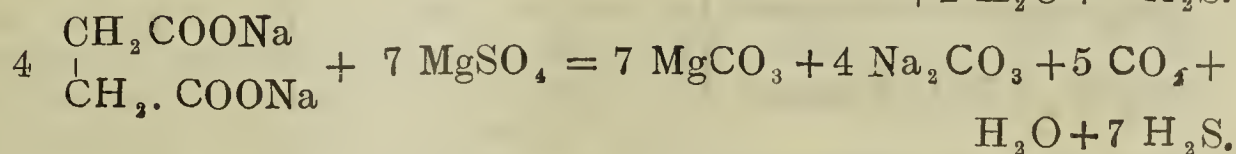
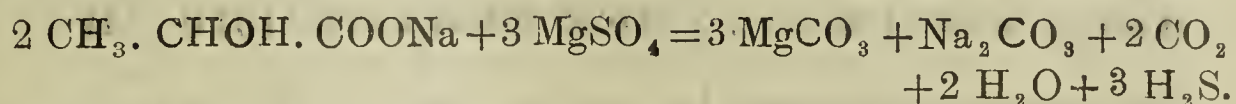
Showing the Effect of Salt on *Spirillum Desulfuricans*

Composition of the liquid culture		Percent- age of NaCl added	H <sub>2</sub> S found	Milligrammes per Litre SO <sub>3</sub>		Date
				Equivalent SO <sub>3</sub> Calcu- lated from H <sub>2</sub> S	Total Sulphate taken	
Tap water	550 c.c.	...	...	...	...	...
Na- acetate	2.5 grm.	...	...	...	...	...
K <sub>2</sub> HPO <sub>4</sub>	0.25 grm.	...	...	...	...	...
Asparagine	0.5 grm.	...	...	...	...	3-5-31
MgSO <sub>4</sub> ·7 H <sub>2</sub> O	0.75 grm.	...	...	...	443	to 25-5-31
Bottle No.						
I.	do.	0.0	107.7	253.4	...	...
II.	do.	0.5	89.2	209.9	...	...
III.	do.	1.0	55.5	130.6	...	...
IV.	do.	1.5	32.0	75.3	...	...
V.	do.	2.0	26.9	63.4	...	...
VI.	do.	2.5	15.2	35.8	...	...
VII.	do.	3.0	Absent	...	...	...

tion which is in agreement with the conclusions of Van-Delden regarding the behaviour of fresh water spirilla in the presence of salt.

Quantitative estimations of H<sub>2</sub>S and CO<sub>3</sub> formed in liquid media with sodium lactate and sodium succinate as organic nutrients were also carried out. Table IX contains the results of these experiments.

The following mechanism of these reduction changes appears to be the most plausible :



#### The Mechanism of H<sub>2</sub>S Production in the Slow Sand Filters

The results of estimation of H<sub>2</sub>S in one run of a filter bed are shown in Table I. There is a gradual increase of H<sub>2</sub>S from 0.5 to 4.4 mgrm. per litre in the course of 12 days the bed being worked at 6 in. vertical per hour.

It will be seen that these results present an apparant difficulty. The output of H<sub>2</sub>S is in excess of what the loss in sulphate warrants (i.e., the difference between the inorganic sulphate content of raw and filtered water). This anomaly may, however, be readily accounted for as follows :—



Sulphur-bearing proteins with their very low content in the water cannot be looked upon as a source for all this excessive  $\text{H}_2\text{S}$  (vide Table II). From the estimations of sulphur in the sand used for filters (see Table X) the fresh sand is not found of itself to contribute any appreciable quantities of sulphur, and certainly not sufficient to justify the extra output of  $\text{H}_2\text{S}$ .

Since, moreover, the other possible sources of sulphur are ruled out, it becomes obvious that the output of  $\text{H}_2\text{S}$  in excess of what the loss in sulphate in the influent warrants, must be due to certain external factors which govern the mechanism of  $\text{H}_2\text{S}$  production. Light was thrown on the problem by an examination of:—(a) the filtering media, and (b) the effect of large variations of temperature in summer and winter, and (c) in the concentration of organic matter. Some of the results are noted below:—

(a) *Filtering Media*:—The depth of fine sand in the Madras sand filters varies from 9 in. to 24 in. About 0.5 per cent of iron as  $\text{Fe}_2\text{O}_3$  is present in the sand. When a slow sand filter goes out of action, it is found: (1) that the entire sand from the coarse sand layer, and gradually extending upward till the filtering skin or “Schlammedecke” is reached, is black (due to  $\text{FeS}$ ). The depth of black sand (containing  $\text{FeS}$ ) depends upon the life of a sand filter—the longer the life the greater the formation of black sand. (2) The top portion of fine sand (about 6 in.) contains more iron (0.60 per cent. as  $\text{Fe}_2\text{O}_3$ ) (vide Table X) after each run of a sand filter, although washed sand is used every time that a filter is started. (3) Sand, after turning dark, due to  $\text{FeS}$  in a filter bed, contains more sulphur than the sand which was not used in a sand filter. Therefore it appears from (2) and (3) that sand as it is used in the filters gathers to itself more and more of iron and sulphur and the process of such accretion is easily explained.

TABLE IX.

Showing the Results of Estimation of  $\text{CO}_2$  and  $\text{H}_2\text{S}$  Formed in Pure Cultures of *Spirillum Desulfuricans*

Composition of the liquid culture	Milligrammes per litre					Period of inoculation
	CO <sub>2</sub>		H <sub>2</sub> S			
	Control	Inoculated	Increase	Actually estimated	Calculated from CO <sub>2</sub> figures	
1. Distilled water 300 c.c. } K <sub>2</sub> HPO <sub>4</sub> 0.15 grm. } Sodium lactate 1.50 grm. } Asparagine 1.3 grm. } MgSO <sub>4</sub> ·7 H <sub>2</sub> O 0.35 grm. }	305.58	704.22	398.64	137.0	154.0	Octr. 5, to Octr. 31, 1931
2. Tap water 550 c.c. } K <sub>2</sub> HPO <sub>4</sub> 0.30 grm. } Na-succinate 2.0 grm. } Asparagine 0.5 grm. } MgSO <sub>4</sub> ·7 H <sub>2</sub> O 2.0 grm. }	315.26	806.58	551.32	167.45	186.4	



TABLE X.

Showing the Results of Analysis of Different Specimens of Band

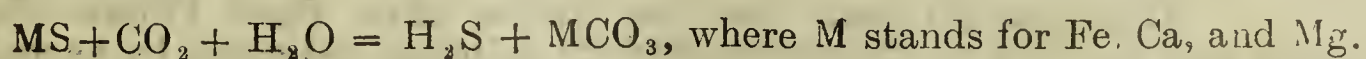
Description of sand		PER CENT			
		Fe <sub>2</sub> O <sub>3</sub>	CaO	MgO	SO <sub>3</sub>
1. Fresh unused river sand	...	0.49	0.026	0.035	...
2. Used but washed sand from bed No. 1.	...	0.48	0.024	0.036	0.01
3. Top portion (6 in.) of sand from bed No. 1 after a run	...	0.57	0.020	0.032	0.014
4. Bottom portion of black sand from bed No. 1	...	0.46	0.028	0.035	0.020

The lake soil being lateritic and hence rich in iron the latter usually in the form of brownish ferric hydroxide, is slowly deposited on the top 6 in. of fine sand layer, especially during the summer months.

The H<sub>2</sub>S produced by sulphate reduction is fixed chiefly as the sulphides of calcium, magnesium and iron in sand and the black iron sulphide when exposed to the sun for purposes of cleaning is converted, at least partially, into the sulphate (Van Hise<sup>18</sup>). Thus the amount of sulphate in sand goes on increasing and not diminishing. Since the sand in these beds has been used for several years, it may be assumed that the original sulphate, if any, must have been completely removed and the sulphate now found in the sand must presumably be the newly-formed sulphate obtaining the sulphur for its formation from H<sub>2</sub>S which in its turn is derived chiefly from sulphate reduction. This alternate reduction of sulphates and oxidation of the sulphide thus explains partly what has been observed and recorded above.

There still remains the problem of the mechanism of the liberation of free H<sub>2</sub>S.

(b) and (c).—The concentration of organic matter and variation in temperature help us to solve the problem. It has been stated previously that there is a high inverse correlation between the lake level and oxidising organic matter. In other words, in the summer months (from April to September) the concentration of organic matter is greatest and the temperature highest (30 deg. to 32 deg. cent.), and the process of decomposition of organic matter is most vigorous during these months. The decomposition of protein and other organic matter liberates chiefly CO<sub>2</sub> and free ammonia. Also sulphides of iron, calcium and magnesium are formed both as a result of sulphate reduction and by the action of H<sub>2</sub>S on iron, calcium and Magnesium present in the sand, and these sulphides, however formed, are acted upon by CO<sub>2</sub> and water thus:—



It has been noticed that an increased output of H<sub>2</sub>S is always accompanied by an increased production of "free ammonia." There can be no direct correlation between H<sub>2</sub>S and "free ammonia" but the apparent relation only shows that the increased amount of "free ammonia" is accompanied by increased quantities of CO<sub>2</sub> resulting in a corresponding increase of H<sub>2</sub>S.

Because of the slower decomposition of organic matter in winter, there are relatively smaller quantities of CO<sub>2</sub>, and thus only a portion of the



iron sulphide is acted upon by  $\text{CO}_2$  to yield  $\text{H}_2\text{S}$ . What is stored up in winter is yielded in summer when  $\text{CO}_2$  is produced in such larger quantities.

It will thus be seen that the iron, calcium and magnisium present in sand help in storing the  $\text{H}_2\text{S}$  liberated by sulphate reduction, the filter beds being admirably suited to act as store houses in the first instance, and the  $\text{CO}_2$  acts as the regulator of the output of  $\text{H}_2\text{S}$  in the slow sand filters of Madras.

*The suitability of Slow Sand Filters for Sulphate Reduction:—*The Madras slow sand filters satisfy all the conditions required for a large-scale reduction of sulphates :

(i) Anaerobic conditions are created inside the filters by two means—(a) the formation of the “schlammdecke” or “the vital layer” on the surface of fine sand in the filter beds; 3 to 4 ft. depth of water on the surface completely prevents oxygen access to the sand, while the dissolved oxygen present in the water is used up by the saprophytic bacteria. In this way complete anaerobic conditions are established inside the filters.

(ii) Organic matter required for sulphate reduction is furnished either by the planktons present in water or by the organic matter in solution.

(iii) Nitrogen salts necessary for sulphate reduction are furnished by “free ammonia,” by the dead bodies of planktons, infusors, etc., which are not at all prejudicial to the sulphate reducers.

(iv) Sulphate reduction takes place best in very dilute nutrient solution. Thus in summer months when sulphate reducers are present in large numbers, the raw water containing proportionately large amounts of organic matter and sulphates in solution affords the best medium for the reduction of sulphates.

(v) The slow rate of filtration at 4 in. to 6 in. vertical per hour is comparable with stagnant or slowly-moving waters where sulphate reduction is generally found to take place.

(vi) Nitrites and nitrates are absent in raw water and their absence is favourable to sulphate reduction.

(vii) The temperature of the tropics (30 deg. to 32 deg. Cent.) is best suited for the development of sulphate reducers in the sand filters.

(viii) The filter sand containing iron, calcium and maguesium acts as a storehouse for the sulphides from which  $\text{H}_2\text{S}$  is liberated by the action of  $\text{CO}_2$  and water.

(ix) When the output of  $\text{CO}_2$  is largely due to the decomposition of excessive organic matter by bacteria, then the formation of  $\text{H}_2\text{S}$  from sulphides in the filters becomes also considerable.

(x) This is the reason why in some months—December, January, February and March—the production of  $\text{H}_2\text{S}$  is not so great as in other months, although the sulphides are being formed all the time in the filters.

Thus it would seem that the Madras Slow Sand Filters offer in every way the ideal conditions required for sulphate reduction by bacteria.

### Conclusion.

In the tropics, slow sand filters appear, therefore, to be very unsuitable for purifying impounded surface waters of the type of the Madras Red Hills lake water, as the conditions there favour large-scale reduction of sulphates and other attendant biological phenomena.

The remedies which suggest themselves are several. A method in which the two principles of aeration and rapid filtration are combined would



probably offer the best solution. "The activated silt process" advocated by Dr. G. J. Fowler, if properly worked out, is expected also to give good results, and the mechanical filters patented by Messrs. Bell, Candy, Jewel or Paterson may also prove to be suitable.

In the dilemma presented by the Madras slow sand filters a little more of organic matter in the effluent seems preferable to the noxious smell of  $H_2S$  and to the unsightly coloured growths in drinking water. Where large financial commitments have been made, as in Madras, it would, of course, be of no practical value to suggest that slow sand filters be displaced by mechanical filters, but the results obtained by mechanical filters may vary approximately be obtained by a modification of the existing filters.

A change which involves the least violence to the existing system seems to lie in the chlorination of raw water at the Red Hills end with a view (1) to eliminate the growths of *Plumatella Tanganaikai* (Rousselet) in the eight-mile-long conduit from the lake to the filters at the Kilpauk, (2) to reduce a portion of the organic matter of raw water, and (3) to afford a sufficient period of contact for the chlorine to act upon water.

An attempt may also be made to reduce the alkalinity of raw water by adding dilute acids at the lake end of the conduit for the high alkalinity of raw water is partly responsible for all the troubles in the slow sand filters. Each of the existing 17 filters (each measuring 200 ft. by 100 ft.) may be converted into a double filter by placing a cross-wall in the primary filter, coarse sand may be used and water rushed through at a much faster rate than now and refiltered rapidly through the secondary filter. Such a process will not afford anaerobic conditions and will therefore prevent reductions of sulphates which take place only in stagnant or slowly-moving waters. The final effluent, if found unsatisfactory, from the bacteriological point of view, may be chlorinated with a very small dose of chlorine.

#### Recent Improvement.

Acting on the suggestions made in this paper, several improvements were effected by which the quality of water as supplied to the city now has considerably improved.

(i) Since August 1932 all the filters have been working at three times the normal rate of 4 in. vertical per hour with the result that the filtrates are almost free from  $H_2S$  and the concomitant growths of colourless sulphur bacteria.

(ii) The chlorination of filtered water has thus been made possible, and the dosage of chlorine also reduced from 1.0 to 0.66 part per million, thus effecting a considerable saving of cost,

(iii) Before entering the sand filters, the raw water is roughly filtered and this removes about 7 per cent. of organic matter.

(iv) Steps are being taken to chlorinate the raw water at the lake end to eliminate the growth of *Plumatella* which infests the conduits (eight miles long).

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